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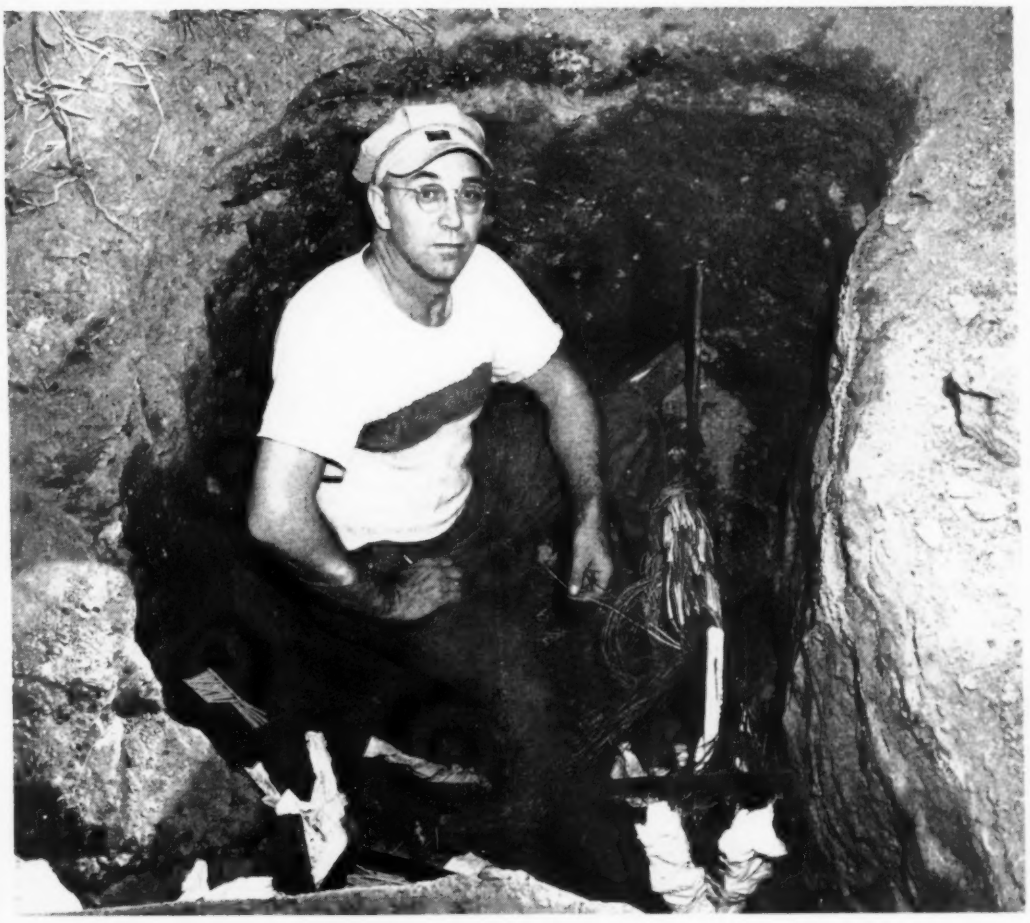
VOL. 151—NO. 21

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY



AN EXACTING JOB

Splicing of cable is a tedious and exacting job. Here Arthur Chaney of United Telephone Co. of Indiana, Inc., takes time out for picture while he's working in Pierceton, Ind., exchange.

Published every week on Saturday by TELEPHONY PUBLISHING CORP., 608 S. Dearborn St., Chicago 5, Ill. Subscription $5.00 per year. Entered as second class matter at the Post Office at Chicago, Ill., under the act of Mar. 3, 1879.

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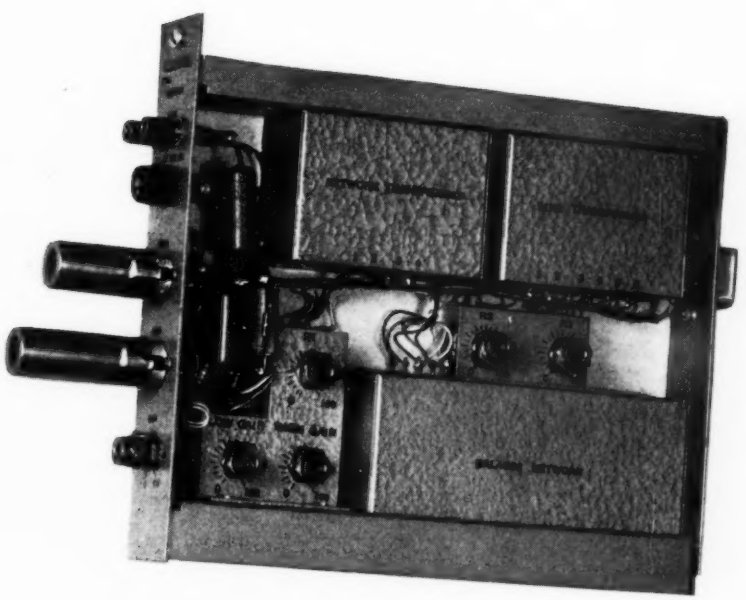

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Z-21 voice frequency repeater

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FLASHES AND PLUGS

CUSTOMER DELIGHT. New York Telephone Co. has recently published a tasteful approach to good customer relations. Titled "What's Cooking?", the booklet includes the following recipe for making a good impression:

Ingredients

1 cup of neatness
lots of cheerfulness
dash of color
large friendly smile
generous amounts of understanding
carefully sifted manners
measured words

Instructions

Combine neatness with a dash of color. Add a generous amount of understanding and cheerfulness to taste. Carefully sift manners and measure your words accurately when needed. Beat together until it stands up straight for good posture. Place in a large friendly smile and cook on front burner—keep temperature low—don't boil. Add a well developed speaking voice and serve with pride. Makes everybody happy.

•

HIGH FINANCE. When American Telephone & Telegraph Co. men were concluding arrangements for the sale of the AT&T company's 250-million-dollar debenture issue recently, one of the steps was to make sure that the right amount of federal tax stamps was affixed to the indenture copy to be held by J. P. Morgan & Co., trustee for the bonds. The cost of the stamps totalled $245,446.

Another point about such big bond issues which is seldom realized, is in connection with their delivery. *The New York Times* reported that when all arrangements for the issue had been completed, brokerage house representatives delivered large batches of them by train to such cities as Chicago, Boston and Pittsburgh.

According to the *Times*, it's cheaper to send a man on a sleeper with a load of bonds than it is to mail them special delivery, insured.

•

NIGHTWEAR. As the Institute of Radio Engineers local publication *Grid* reports it, one member of the San Francisco Section, who shall remain nameless as long as the First Amendment remains in reasonable force, recently spent quite a miserable night under his electronically-controlled electric blanket. As a matter of fact, so did his wife.

It seems that she suffered from the cold, while he was much too warm, and all through the night each kept waking up—he to keep backing the controls for his side down, she to keep turning her side up.

Came morning, he assembled his trouble-shooting equipment and checked out both electronic controls with no sign of malfunction. What he didn't find out until some time had passed was that the day previous his wife had aired out the blanket and re-installed it upside down.

CIRCULATION

Guaranteed circulation of this issue is 11,548 of which 11,014 is paid.

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
Since 1901

November 24, 1956

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WESTERN REPRESENTATIVES:
McDonald-Thompson, San Francisco, Cal.
Also offices in Los Angeles, Seattle, Dallas and Houston, Tex.; Tulsa, Okla., and Denver, Colo.

Vol. 151, No. 21. Published every week on Saturday by TELEPHONY PUBLISHING CORPORATION, 608 South Dearborn St., Chicago (5), Ill. 20 cents per copy (except special issues). Subscription $3.50 per year U. S.; $4.50 Countries in U. S. Spanish Postal Zone; $4.50 Canada; $5.50 Other Countries.

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Stromberg-Carlson carrier unit is inspected from the front. You get at tubes and test points without removing anything. You reach relays by removing the slip-on dust-proof cover; pull out hinged chassis to get at filters, main terminal strip and test jacks.

How this combination opens the door to increased profits for you...

With Stromberg-Carlson Carrier Equipment you get this combination of features that adds further prospects of increased revenue to the over-all advantage of using carrier:

Space saving—Carrier racks can be placed flush against the wall. All three units—voice, signaling and line filters (if line filter balance is not required)—are packaged in a space only 8¾ inches high.

Ease and economy of maintenance—All test and maintenance functions are performed from the front. To test or service filters or main terminal strip, your man simply loosens one screw. The entire front panel swings out, making all sub-panels instantly accessible.

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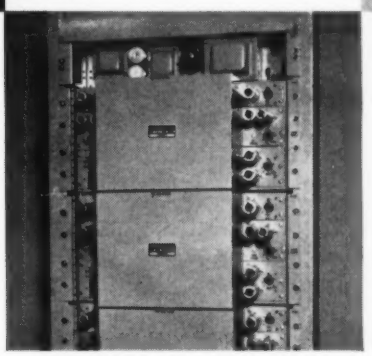
Standard tubes—All tubes are standard types, available from suppliers in your own community. They are mounted outside the cover for proper heat dissipation.

These and other features of Stromberg-Carlson Carrier Equipment add up to ease of installation and maintenance for long, profitable service.

Your nearest Stromberg-Carlson sales office will be happy to furnish complete details.



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The only honest way to prove battery life is to test its performance over a long period of time. But, unfortunately, most battery designs change radically before a 20-year interval has passed. So the testing must begin all over again.

Not so the Exide-Manchex. The unique spiral button positive plate design is the same today as it was when it was first developed. Nothing has been found to surpass it. However, today's battery incorporates significant improvements in materials and construction that assure even greater length of service and even better performance than were possible in the case of the batteries shown above.

The actual evidence of Exide-Manchex service life demonstrates factually what many another battery maker is tempted to merely claim. This is a sobering thought for any battery user about to order new batteries for floating service application or the equipment requiring them.

Be safe. Specify Exide-Manchex. For information, call the Exide sales office near you. Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 2, Pa.

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No other independent telephone cable manufacturer can make this statement supported by proved values . . . only ANSONIA has the experience, equipment and know how to deliver these great cables.

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Lenkurt Microwave ignores the weather!

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These figures and facts tell one company's remarkable (but not unusual) story of Lenkurt Microwave's dependability throughout a year of service.

Twenty-four channels of Lenkurt Microwave were set to work, handling the busy traffic over this troublesome terrain. Confidence in this equipment was confirmed as the months went by and outages proved measurable in minutes only—very few minutes, very quickly cleared up by minor, *indoor* maintenance!

Today, on that same stretch the telephone company maintains its physical lines—as stand-by facilities! Day-in, day-out traffic goes over equipment they can be sure of—in any weather!

Investigate *dependable* Lenkurt Microwave today—
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Automatic Electric "Follow-Thru" Engineering eliminates ALL problems in Lenkurt Microwave installation and maintenance.

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Station Protection–A New Design

Only the fuses and the discharge blocks remain unchanged–performance and dependability continues as before. There is a phenolic fuse mount, rather than porcelain–a flexible neoprene base with integral wire entrance sealing slots instead of open wire holes–a fuse mount and terminal post redesign that puts the wiring snugly in place without removing fuses–a fuse mount that can be easily reversed to wire from right or left. All metal parts are either bronze, aluminum or stainless steel.

Reliable's new Series 2000 Station Protector replaces the Series 1000 with design changes only–changes that are good for the Telephone Plant.

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E FOLKS WHO PAY THE BILL

Everyday the subscriber sees the telephone instrument, handles it, listens to it, speaks into it.

To the subscriber, that telephone instrument represents **you**, **your** company, **your** service.

To the extent that you provide the subscriber with an instrument pleasing in appearance, with superior transmission and reception quality, you are increasing the subscriber's satisfaction with you, your company, your service.

The NORTH N-541 Telephone is a superior instrument on all counts.

The modern, streamlined case and handset have clean, functional lines.

Transmission has been brought to "Hi-Fi" levels. The N-541 Telephone has an improved anti-sidetone circuit and a higher gain which provides clear, natural transmission over long loops. An automatic compensating network insures the same clear, well controlled level on short loop transmission.

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IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH, WASHINGTON EDITOR

Utilities—both commercial and cooperatives—emphasizing need for change in state laws to permit reimbursement for relocation costs due to federal highway construction. SEC studies use of telephones by "boiler-room" stock promoters.

THERE IS some evidence that public utilities, including telephone companies, are already getting busy at the state legislative level to take better advantage of the federal-aid highway law passed by the last Congress. As most readers of this department already know, this law permits the states to reimburse public utilities for the expense of relocation of their facilities due to highway construction, *only* provided such compensation is allowable under state law. This permissive federal statute, therefore, puts the responsibility on the states. And it must be confessed that the state legislative situation is not in the best of shape right now to fulfill this responsibility, as far as the public utility companies are concerned.

Before any progress can be made, of course, the utilities must unite in each state. There must be a union not only of all members of the public utility family which incur highway relocation expenditures (gas, electric, telephone, water, etc.), but even some members within the same class who have not been too friendly with each other on other matters; notably, the business-managed electric companies as distinguished from the publicly owned and operated plants, and Rural Electrification Administration cooperatives.

But in Oregon, at least, all members of the utility family seemed to be getting together on this proposition and putting their respective shoulders to the wheel. The Oregon utilities have collectively served notice on the state highway commission that they hope to receive some of the money to be made available to the state under the federal government's accelerated highway construction program, passed by the last Congress.

Under the present state law, there could be no reimbursement of Oregon utilities for highway construction. So, the utility delegation to the state highway commission expects to get some commitments for a change in the state law that will allow reimbursement under the federal act. The delegation before the Oregon Highway Commission included representatives from private power, gas, and telephone companies, and from public utility districts and the REA co-ops. The spokesmen indicated they would seek action by the next legislature, so that Oregon utilities might take advantage of the federal provision, and asked that the commission confer with them on the problem.

Spokesmen said relocation costs generally are passed on to the utility consumer, who therefore pays twice for highways: Once in higher taxes and again in higher rates. Francis Hill, attorney for private gas and power companies in Oregon, summed the problem and asked the commissioners: "Will you go along with us? What kind of legislation is needed? Will you assign a member of your legal staff to work with the utilities? The utilities will want to submit legislation. We want to work with you."

Commissioner Charles Reynolds reminded the utilities spokemen the commission is interested in their problems, but that it also must be mindful of protecting the road users' funds. Hill said a similar situation is present in 42 states, and the commission later agreed that on such a complex problem it must "move cautiously before committing ourselves." It was pointed out that any state payment for relocation of utility facilities would necessarily reduce by that amount the actual highway construction.

Other spokesmen before the commission on this problem included Earl R. Dean of the Oregon Independent Telephone Association; John R. McCullough of the state public utilities commission; Alex Brown, Portland city attorney; Larry Bauer, manager of the Central Lincoln County PUD; Edward Branchfield, attorney for California Oregon Power Co., and Lee Wooden, representing state REA groups.

Boiler-Room Connections

Several years ago this correspondent idled away a tiresome train ride in a discussion with several telephone industry lawyers on the subject of how many crimes could be committed by telephone. We checked the main felony classification of the criminal code and, for good measure, even skipped through the Ten Commandments. The general conclusion was that, at least on an accessory basis, it is possible to commit just about every major type of crime, except murder or other acts of physical violence. (Note: This was before the crime thriller movie of a couple of years ago, "Dial M for Murder," in which Princess Grace Kelly actually got knocked off on the screen through the direct intervention of a telephone call.)

By far the great bulk of wrongdoing by telephone falls into the category of swindling, especially by phony stock sales. This sort of thing is giving the Justice Department and the Securities and Exchange Commission much concern. Witness the new law passed at the last session of Congress designed to tighten up the criminal law traps for those characters who try to sell sour stocks by telephone calls from Canada and other places outside of the United States.

Some idea of the extent to which the telephone is used in such operations may be obtained from a recent statement by A. Downey Orrick, San Franciscan member of the Securities and

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Exchange Commission, who told about one New York firm against which court action is now pending. In three months this firm had grossed 2 million dollars. It had a telephone bill of $200,000. It employed 30 salesmen whose net income was $600,000. The securities sold by these salesmen to customers over the telephone were all virtually worthless.

In the last 3½ months the SEC has filed 25 injunctions against outfits engaged in such activities, which are, of course, violators of the Securities Act. Commissioner Orrick says that the salesmen employed in such operations are frequently ex-convicts, narcotics peddlers, and former bootleggers. He said they are a transient group of swindlers and confidence men who float from place to place. A surprising number of their "suckers" do not even bother to squeal—probably mortified or humiliated by the thought they (the "suckers") are supposed to be smart businessmen. But, nevertheless a good number of them do squeal. Commissioner Orrick says the SEC already has the names of 9,000 victims, some of whom will be witnesses in court cases. It is in the criminal courts, that the SEC hopes to catch up with these malefactors. Merely suing them for damages would only get a laugh. Commissioner Orrick explained: "You can't get these people with civil suits. You have to put them behind the bars."

In financial and trading circles such operations are called "boiler shops." That nickname is not derived from the fact that fly-by-night telephone canvassers actually conduct their operations from basement boiler rooms or other hole-in-the-wall spaces, although probably a good many of them do. The name "boiler shop" refers to the high-pressure which is used by the salesmen over the telephone to convince the sucker on the other end of the wire that the opportunity of a life time is knocking on his door—or at least calling on his telephone.

How does the SEC catch up with these telephone frauds? In the past four months the SEC has opened an extra intensive investigation into boiler-room activities. Nearly 10,000 "investors" will be interviewed before it is over. The favorite bait is still the glamorous new mining and chemical stocks: Uranium, lithium, and titanium. But, quite a few are still pushing mythical oil wells and gold mines as in former years.

SEC investigators have found boiler rooms with lines of 20 to 30 telephones crammed into one-room offices, manned by unshaven characters in undershirts. Ex-carnival barkers, pitchmen, shell game operators and other experienced confidence racketeers are finding a new career in becoming "telephone salesmen." Oddly enough, the SEC finds evidence of cooperation and agreement among about 50 odd boiler rooms estimated to be scattered around the New York financial district. One outfit doesn't want to throw a monkey wrench into the other outfits operations. So they decide amongst themselves who

REA Makes Four Telephone Loans

The Rural Electrification Administration the week of Nov. 5 made $811,000 in loans to improve and expand telephone systems in Wisconsin, Maine, Iowa and Louisiana. The U. S. Department of Agriculture announces that the four loans to the new borrowers will provide dial service to 2,174 farm families and other rural subscribers. Of this total, 824 presently have no telephone service. Details of the loans follow:

Dickeyville Telephone Corp., Platteville, Wis., $100,000, first loan (Nov. 7).

The borrower is a new commercial company which plans to furnish dial service to 283 rural subscribers. Of this number, 73 have no telephones now.

As a nucleus for the new project, the borrower proposes to acquire with its own funds the facilities of the Dickeyville Farmers Mutual Telephone Co., which consist of a central office building and 6 miles of toll line. This company furnishes switching service to 210 rural families who own 55 miles of line in the area.

New construction which the borrower plans will include an automatic central office building at Dickeyville.

Leon J. Droessler is president of the Dickeyville Telephone Corp.

*

The Union River Telephone Co., Aurora, Me.; $189,000, first loan (Nov. 9).

The borrower, a commercial company, plans to bring service for the first time to 349 rural families. In addition, it will furnish improved service for its 93 existing subscribers. The company now operates one central office.

The borrower will construct automatic central offices at both Aurora and Otis.

Herbert T. Silsby II is president and William S. Silsby Jr. is manager of the Union River Telephone Co.

*

Brooklyn (Ia.) Mutual Telephone Co.; $292,000, first loan (Nov. 9).

The borrower, a commercial corporation, plans to provide automatic service to 901 rural subscribers in its service area, including 56 farm families now without telephones.

With the REA loan, the borrower intends to construct an automatic central office in Brooklyn, and add 36 miles of new line. Service without toll charge between the Brooklyn exchange and the towns of Hartwick, Malcom and Montezuma will be continued in the new system.

Ira Berkham is president of the company, and Norman N. Spillett is manager.

*

St. Helena Telephone & Telegraph, Inc., Greensburg, La. (Mailing address: 6026 Memphis St., New Orleans); $230,000, first loan (Nov. 9).

The borrower, a commercial corporation, will use these funds to furnish initial service to 346 farm families and improve service to 202 existing subscribers. At present, the company provides magneto service over 80 miles of line.

The REA loan will enable the borrower to construct new automatic central offices at Greensburg and Montpelier, and 93 miles of line. Commercial office facilities will be located in a separate building in Greensburg.

C. G. Melville is president and manager of the St. Helena Telephone & Telegraph organization.

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will push which phony stock, so that all may share the suckers fairly.

The basis for any such operation must always start with a "sucker list." These come from varied sources: Stockholder lists, new car registration lists, obituary lists, even professional directories such as medical and legal membership lists have been used and apparently the pickings have been good even among such intellectual fellows.

One step which the SEC hopes to take to cut down on this particular crime by telephone may cause an additional burden on small utility companies unless some exemption is made. That is the SEC proposal of last July to amend its so-called Regulation A, under which small company issues of less than $300,000 may be offered for public sale without SEC registration. A good many honest, legitimate, but small, public utility companies have found this exemption very useful in avoiding the unnecessary expense and delay in preparing SEC registration data. Indeed, there have been efforts in the recent past to increase the exemption for such companies.

There is a good, just, and reasonable basis for the SEC to make a distinction between small utility companies security issues and the swindling penny stocks issued by fly-by-night companies for the boiler-room racketeers. The distinction lies not only in the fact that public utility companies, however small, constitute essential and legitimate operations, but also in the fact that, with very few exceptions, public utility securities are already regulated and controlled at the state level. Furthermore, this regulation by the state public utility commissions of utility company securities issues is a far more detailed supervision and a much better safeguard for the investor, than the mere registration requirements of the SEC.

Equal Time for Everybody!

Jerry Voorhis, former California congressman and executive director of the Cooperative League, has managed to think up a new headache for the people who run television stations in the United States, just at the time when they thought they could get a little peace and quiet—now that the elections are over and the politicians are still busy with the post-mortems.

Jerry has written a letter to the manager of every TV station in the United States protesting what he calls an "anti—co-op" movie, known as "The Senator's Daughter." It seems this film has been sponsored by the National Tax Equality Association (NTEA), a group which feels that cooperatives ought to pay taxes just like everybody else. Needless to say, the cooperative group thinks this very idea is awful.

Anyhow, the NTEA has apparently developed this movie film about a senator's daughter with the purpose of getting it shown over some TV stations. Jerry Voorhis says that it is "a scurrilous attack" on all types of cooperatives. He specifically mentions savings and loan associations, credit unions, mutual savings banks, mutual insurance companies, but not rural telephone cooperatives or rural electric cooperatives.

"The film," Voorhis said, "levels charges against these forms of enterprise which, if leveled against any specific co-op or mutual enterprise, would be slanderous and actionable in a court of law." Voorhis predicted that the film's sponsor, the NTEA, would first ask TV stations to show the movie on sustaining (free) time. Later, he added, NTEA may offer to pay for showing the movie. Voorhis said that the groups attacked in the movie "will have the firmest possible grounds for requesting equivalent free time to present the facts," whether it is shown on free time or paid time.

If Jerry is right about this, it is easy to see where the Federal Communications Commission, which ultimately decides such questions, is going to be in for a hard time, sooner or later. Where is this "equal time" business going to end? The Federal Communications Act specifically mentions equal time for political candidates for office. The cooperatives are not exactly candidates for office, and neither is the NTEA. But Voorhis still thinks there is a question of "equal time" involved.

Several years ago a well-known California atheist brought up this same basic idea, in a somewhat different way. He asked that the FCC refuse to renew the broadcast licenses of radio stations which went in for religious programs, but which did not think that their listeners would be interested in the free-thinker's point of view. The FCC finally decided in favor of the radio stations, but not without considerable dissent by former FCC Chairman Paul A. Walker (himself a very good church member) who felt that there were at least two sides to be heard on this question.

But if this "equal time" idea is extended to disputes, other than the arguments of political candidates actually running for office, the FCC will soon discover that there are far more than two sides to a good many questions. Jerry Voorhis has already registered a beef on behalf of the cooperatives.

How about the vegetarians and the prohibitionists? They are both organized, in some states, as political parties. They have actually put candidates on the ballot for some offices. The vegetarians might not feel they are getting a square deal when they look at their TV sets and see all those luscious beef, pork, sausage, and poultry ads. The prohibitionists might well take exception to some of the more effervescent beer ads on TV.

Even the amalgamated burglars and safecrackers might eventually want "equal time" to counteract the police department propaganda regularly put out by such minions of the law as Sergeant Friday in his "Dragnet" program.

One thing is sure. If Jerry Voorhis gets away with his demand for "equal time," TV stations as well as FCC can expect to be hearing from Sunbathers, Hobos of America, and a host of other eccentric minorities who might well take umbrage at the sort of things which come into our living rooms via TV. To paraphrase that famous passage from Marx's "Manifesto": "Crackpots of America arise; you have nothing to lose but your equal time!"

To Be Welcomed

The fear that automation will create widespread unemployment flies in the face of history. Every improvement in production methods, along with every invention of importance, has ultimately produced not fewer jobs, but more and better jobs.

The automobile destroyed the horse and buggy business—but an almost infinite increase in employment and opportunity followed. More recently, prophets of gloom forecast that dial telephones would bring a catastrophic degree of unemployment among operators. Yet there are 70 per cent more telephone operators than there were 10 years ago.

Automation is to be welcomed, not feared.—INDUSTRIAL NEWS REVIEW.

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THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITORIAL DIRECTOR

WE HAVE a letter from James O'Neal Henderson, assistant manager of municipal telephone service for the government of The Virgin Islands of the United States, Christiansted, St. Croix, in which he makes the following statement with reference to the Ed Meeks method of locating opens in cable conductors by the use of two tone sets of different pitch intensity and an exploring coil:

"We have recently experimented with this method on an underground, direct burial cable since reading your article, and are pleased to report that the results obtained were not only satisfactory but excellent."

•

Our long time friend Dory J. Neale Sr., of the Neale Construction Co., Inc., came up with a new story on the destruction of telephone plant by woodpeckers. It is not poles but lead-covered cable that receives the damage this time.

Down in Texas near San Antonio they found a total of 14 holes in nine 4-inch lead sleeves on an aerial cable. This trouble was first blamed on squirrels but it was later learned that woodpeckers caused the damage. The holes were all on the under side of the sleeves. It is assumed that noise caused by gas flowing through the cable may have attracted the woodpeckers attention and caused them to drill the sleeves.

This is the first case of woodpecker damage to lead cable to come to our attention. Lets hope that this hard-beaked bird does not develop a taste for lead in all parts of the country.

•

The Pacific Telephone & Telegraph Co. has a summertime engineers plan whereby college undergraduates try their wings in the telephone business. These young men are given a title as assistant engineer. They first get a four-day orientation course and are then assigned to regular engineers with whom they work for the entire summer season.

Their duties are varied and it lets the company see how they fit into the business. It also gives the students a chance to see if they like telephone work.

As an example, one young assistant engineer has worked for the company for three summers. He was first a frameman, then an outside plant engineer and this year is in the toll service transmission group on TV circuits.

The Pacific Bell company has found that these young men are enthusiastic about their work and tell others about the opportunities in the telephone business. Many of them actually become unofficial recruiters of their fellow students.

This certainly appears to be a good plan for the entire communications industry to follow.

•

We made an auto trip down the eastern shore of Maryland recently and were amazed at the increase in the number of outdoor type pay telephone booths. Practically all large filling stations in that area are now equipped with at least one of these booths. The same applies to restaurants and many other places of business.

Another new pay booth location we noted on this trip is the roadside park and picnic areas. This appears to be an excellent location as these turn-outs provide ample safe parking space off the highway for comfortable telephoning.

•

Your writer recently spent a most enjoyable day in the laboratories and factory of the Stromberg-Carlson Co. at Rochester, N. Y. We were amazed at the many new developments now being perfected in the laboratory and those that are now on the production line in the factory. Space here will not permit a detailed description of all of these new devices, but perhaps the one that impressed us the most was the new transistorized electronic switching system.

The components of this system are mounted on plastic cards about 6 inches x 8 inches in size. These cards carry printed circuitry and are plugged into the main unit by the use of multi-contact plugs and jacks.

The majority of the components such as resistors and capacitors are mounted on the cards automatically as they pass through a specially designed machine. Soldering is then accomplished by the dip method.

In order to avoid the use of a relay for ringing from a conventional ringing generator, 20-cycle, 20-volt ringing current is used. This voltage is then stepped up to a normal ringing potential by the use of a small transformer associated with each subscriber's line.

We also enjoyed examining some communication trailers that are being constructed for the use of the Bell System. Each trailer is equipped with a 600-line, 1,000-terminal, XY dial switching system. These trailers are complete with main frame and power equipment.

The switching equipment arrangement appears ideal with the line finders mounted on the sides of the trailer and the connectors and selectors mounted back-to-back in the center. This plan provides ample working space for maintenance personnel. The interior of the trailer is well illuminated by using fluorescent lighting fixtures.

These trailers should prove ideal for the rapid restoration of service in disaster areas. If an exchange is lost because of fire, explosion or bombing, this trailer will restore service more quickly than would be possible to provide and install central office equipment by conventional methods.

Moreover, there is no doubt that this trailer can be used to advantage in providing service quickly in new hous-

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ing developments. Its use will eliminate the need for the outdoor type booth installed on street corners in these new areas. While the corner booth is admittedly better than no telephone service at all, it is not as satisfactory as a telephone in one's living room.

Furthermore, by using this trailer in new developments, it will permit the operating telephone company to construct a suitable exchange and install switching equipment in a normal manner. At this time, the working lines can be cut over from the trailer to the permanent exchange and the trailer moved on for use elsewhere.

We believe that this type of trailer will be extensively used in the future.

•

We often wonder how long it will be before someone solves the directory problem in large metropolitan telephone exchanges. Directories in their present form are becoming so large and cumbersome that they prove most unwieldy as well as expensive.

In Paris, recently, we noted that they have 11 large directories stacked outside the public telephone booths.

•

First aid kits now being manufactured by one company have all liquids packaged in polyethylene unbreakable bottles. These items, when carried by men on the job or in vehicles, eliminate the problem of breakage. The solutions packaged in polyethylene bottles include: "Neutralize," the acid-alkaline, counter-irritant, hexachloraphene antiseptic soap, spirits of ammonia, boric acid solution and rubbing alcohol.

•

The fifth annual symposium on "Technical Progress in Communication Wires and Cables" is to be held on Dec. 4, 5 and 6, 1956, at the Berkeley-Carteret Hotel, Asbury Park, N. J.

This annual meeting is held under the joint auspices of Industry and the Telecommunications Division, Signal Corps Engineering Laboratories. The subject matter of this year's program will be of general interest to the wire and cable industry and to communication and operating telephone companies.

Requests for additional information about the symposium should be directed to Mr. H. L. Kitts, Wire and Cable Symposium Committee, Communications Department, SCEL, Ft. Monmouth, N. J.

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It has been said that the dictionary is the only place where success comes before work.

Plant Man's QUIZ

By RAY BLAIN, Technical Editorial Director

Q. Will it be satisfactory to splice a terminal with a lead-covered, paper-insulated tail into a plastic-jacketed and insulated cable?

A. We would not recommend this practice because considerable trouble has been experienced in the past due to moisture migrating from the plastic cable into the paper-insulated stub and causing leakage trouble.

Rather, it is recommended that you obtain terminals equipped with plastic-insulated cable stubs. This type of terminal is now on the market.

•

Q. Please explain to us what variation in ground may be expected in different type soils.

A. A series of ground resistance measurements made by the Bureau of Standards is summarized in the following table:

Grounds Tested	*Soil*	*Resistance in Ohms*		
		Average	*Minimum*	*Maximum*
24	Fills and ground containing more or less refuse such as ashes, cinders, and brine waste.	14	3.5	41
205	Clay, shale, adobe, gumbo, loam, and slightly sandy loam with no stones or gravel.	24	2.0	98
237	Clay, adobe, gumbo, and loam mixed with varying proportions of sand, gravel, and stones.	93	6.0	800
72	Sand, stones, or gravel with little or no clay or loam.	554	35	2700

Q. When rural distribution or "B" type cable is connected to conventional type lead-covered cable, should protection be used at the junction point?

A. We are advised by one authority that the dielectric strength of the "B" type rural cable is a number of times greater than the conventional paper-insulated cables. For this reason, protector blocks are required at the junction of the rural cable and the paper-insulated type to equalize the potential difference at the junction point caused by surge currents flowing through the rural cable to the conductors of the paper-insulated.

It is further explained that no protection is required at the junction of rural cable and plastic-insulated conductor cables as the dielectric strengths of the structures are of the same order of magnitude.

When open wire lines or drops are connected to rural cables, protection should be provided at each junction point if the open wire is exposed to high lightning incidence.

•

Q. What precautions are recommended to prevent glass insulators from being broken on an open wire line which runs near a school house? These insulators, we have learned, make good targets for youngsters who aspire to become base ball pitchers.

A. The best plan, to our knowledge, and one that is frequently used with considerable success is to install rubber compound non-breakable insulators on all poles near the schoolhouse to replace glass.

It is claimed by the manufacturer that these insulators are equal to glass under both dry and wet weather conditions. The rubber compound is impregnated with a wax-like substance which tends to prevent moisture from forming leakage paths. This insulator is designed for use on wood pins and, with a wood cob, it may also be used on steel pins.

Section 25 (Continued)

"O" Trunks to the PBX Attendant

Attendant trunks are provided from the zero level of the first selector or selector-connector to the PBX switchboard to permit the extension user to reach the attendant on assistance calls. The attendant may complete the connection from the "O" trunk to a central office trunk, a tie trunk, or to another extension.

Trunks to the PBX attendant are usually assigned in the same manner as outlined for direct dial trunks.

Intercepting Trunks

Vacant level intercepting trunks are connected to vacant selector levels and terminate on trunk jacks at the switchboard so that misdialed calls, reaching the levels on which there are no extension numbers, may be intercepted by the attendant. The number of such calls are usually quite small and one trunk is generally sufficient to care for traffic of this sort.

Vacant connector terminal intercepting trunks are multipled (wired together) through all vacant connector terminals and terminate on trunk jacks at the switchboard. Normally, one trunk per 400 connector terminals will be adequate to care for such intercepting calls.

Tie Trunks

Several types of tie trunks are available to enable extension users of one private branch exchange to place calls through their switchboard to the extension of another private branch exchange, without establishing a connection through the central office.

The traffic engineer usually designates the levels on which repeating or dialing tie lines are to be installed. Tie trunks are assigned in the same order at the switches and the switchboard jacks at one end and in the opposite order on the switches and jacks at the other end.

When an entire level is assigned to one tie trunk group and less than 10 trunks are needed, they are connected to first choice terminals and the remaining terminals are made busy.

Where two-digit rotary hunting selectors are involved and more than one tie line is assigned to a given level, the future requirements of each group

should be considered in order to allow consecutive terminals for growth where necessary.

Assignment of Trunks to Jacks and Lamps At Switchboard

Either of two general arrangements can be used for assigning trunks at PBX switchboard positions. For the smaller and medium size trunk groups, common trunks are used for outgoing and incoming services and a common trunk multiple is used throughout the switchboard.

But, when the trunk groups are large it is generally economical or desirable to provide separate outward and inward trunks. When this is the case, the incoming trunks are located in a separate multiple and may be or may not be multipled throughout the board, as efficiency dictates.

The central office trunks, attendant trunks and tie trunks generally are located near the top of the answering jack space, the individual arrangement being based on the plant best suited for the PBX installed. The following order, starting from the top of the answering jack space and working downward, may be used as a guide for PBX equipment with a common trunk multiple, it being recognized that more than one type of trunk can be assigned to a given level or to a jack strip:

(1) Central office trunks.

(2) Tie trunks (Dial repeating tie trunks need two jacks).

(3) Trunks to attendant ("O" trunks).

(4) Manual extension lines. These lines may also be connected to the bottom strip of the extension multiple, if it is expected they will be converted to automatic operation at a later date.

(5) Intercepting trunks.

(6) Dial code calling trunks (used by attendant to reach code calling equipment).

(7) Miscellaneous.

(8) Manual conference jacks.

Central Office Trunks

When selecting locations for central office trunks close consideration is given to the operator's reach, to balancing the panel loads, to visibility of the trunk signals, and to cord congestion. In the case of the small groups, some advantages are gained by locating trunks near the middle of the trunk

multiple. This gives the attendant a clear view of the lamp signals which could otherwise be obscured by cords in adjacent jacks. If available, spare jacks are allowed between working trunks to reduce plug congestion.

Combination trunks are connected to switchboard jacks in the same order that they are assigned at the central office. This is the reverse of the order at the PBX switches and it is assumed that the PBX attendant selects trunks on a right to left basis.

Two-way central office trunks are assigned in the same order at the PBX switchboard as at the central office. To avoid concentrating the first choice incoming attendant trunks—from non-graded groups not reversed—on adjacent jacks, first and last choice trunks may be assigned in rotation to the PBX multiple.

Tie Trunks

As mentioned under "Assignment of Trunks at PBX Switches," tie trunks are assigned in the same order at the switchboard jacks and the switches at one end, and in the reverse order at the jacks and switches at the other end.

Attendant "O" Trunks

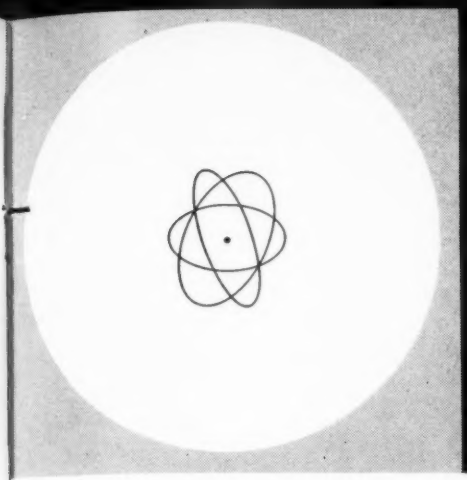
The same rules that govern the operator's reach, load balance and cord congestion that are given for central office trunks apply to attendant trunks. Congestion is usually avoided by spreading the high calling trunks over the jack strip and by allowing spare jacks between working trunks.

Section 26

Let's Talk About PBX Attendants

Technically you know all there is to know about your job as a PBX Adviser. You understand how a PBX switchboard should be operated, if pleasing service is to result. But after all, no amount of technical perfection can ever replace the know-how of managing people. So, let us digress from our usual routine and talk about the folks who operate the PBX switchboards.

(Section 26 to be continued next week)



TELEPHONY'S ELECTRONICS SECTION

BY HAROLD B. McKAY, ELECTRONICS EDITOR

INVENTIONS WANTED

IT IS said that a citizen once wrote to the patent office for a list of things that hadn't been invented yet. Today there is just such a list, put out by the National Inventors Council of the U.S. Department of Commerce. Titled "Technical Problems Affecting National Defense," this list itemizes a number of inventions which are badly needed by the Armed Forces.

Among the electronic needs is a gadget which can be carried by a rocket to measure wind velocities at from 100,000 to 400,000 feet altitude; quartz crystal units which will work at 300° C. Also sought is a heat rectifier, or one-way heat exchanger —a static device which will take heat away from small electronic devices.

In the transistor line an urgent need exists for an encapsulating material which will provide an assembly having high heat dissipation and mechanical ruggedness. A coating or other means of protecting the surfaces of transistors which will prevent deterioration is also wanted.

A quick-heating thermionic cathode is needed, which will be capable of operation in less than one second. Along this same line there is a need for someone to devise a thermionic emitter or cold emitter capable of greatly increased efficiency and suitable for use in the usual thermionic electron tube.

Got any ideas?

ELECTRONIC HANDBOOK

A NEW electronics data handbook has been published by Allied Radio Corp. of 100 N. Western Ave., Chicago 80, Ill. The handbook contains 64 pages of formulas and data most commonly used in the field of radio and electronics.

Among the contents are decibel conversion tables, attenuator networks, loss pads, meter formulas, transmission line formulas, vacuum tube equations and tables for wire coils, logarithms and trigonometry.

SILICON POWER DIODES

ONE OF the by-products of the experiments with the battery which gets energy from the sun is the silicon power diode. The solar battery, of which we already have heard and read so much, is made of silicon and in the course of developing the cell a silicon rectifier was developed also. This rectifier has many advantages over other types of rectifiers and has great versatility. It is made of single-crystal silicon which has been doped with boron and phosphorous.

The silicon must first be obtained in a state of very high purity. This is done by methods discovered in transistor development. After it is purified, the other elements are introduced into the surface of the silicon by a diffusion process, which in effect permits the phosphorous and the boron to "soak" into the crystal from opposite sides.

This results in a condition on one side of the crystal where a surplus of electrons exists. The other side has a shortage of electrons. Instead it has vacancies or "holes" which could be filled by electrons. When current is applied to the crystal, it will flow if the direction is such that the electrons on one side can move over and fill the holes in the other side. In the reverse direction the current is blocked for practical purposes. This means that alternating current would be rectified to dc.

The silicon diode possesses advantages over other rectifiers because it will handle much greater quantities of power. This is partly due to the lower resistance of the crystal compared to selenium or copper oxide. Because of its lower resistance, it does not have great heat losses. However, it can be operated at temperatures as high as 200° C.

The silicon diode rectifier is expected to prove useful in applications other than in the power field. It can be used for voltage reference, pulse clipping, modulation, temperature control and for both high and low frequency carrier applications.

Size of the new rectifier varies with the power handling capacity. A rectifier which will transmit 10 amperes of current is smaller than a paper clip. In quantity manufacture, the cost of the silicon used in a diode like this would be only a couple of cents, it is said.

SMALLEST HEARING AID

A HEARING aid which is so small that the case containing the battery, amplifier and microphone can be concealed behind the ear has been developed. The amplifier contains four transistors and is connected to a tiny receiver which fits in the ear. The battery will last for over 100 hours of use.

RADIO TELEPRINTER

A NEWLY developed radio teleprinter is being tried by airplane pilots on the North Atlantic run. The new printer, developed by Federal Telecommunications Laboratories, supplies weather information

from stations in Canada and Scotland, at from 60 to 100 words per minute. This frees the voice radio channels for other purposes. Ordinarily the voice bands would be used 80 per cent of the time for weather reports.

FACSIMILE

THE JET AGE brought a problem to the Canadian Weatherfax system which has been sending 22-inch-x-18-inch weather maps of North America over a facsimile system. It became necessary to extend the map to include part of the Atlantic, but the facsimile transmitter wouldn't take a bigger sheet.

One idea was to send the map in two pieces, then paste them together. However, a way was discovered to splice the charts electronically, according to Muirhead's "Technique." Two transmitters are employed. One sends part of the map. A specially developed switching mechanism cuts in the second transmitter when the first reached the end of its transmission.

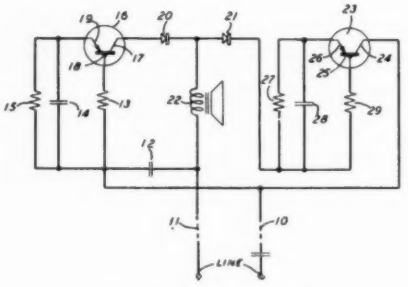
The result is a 30-inch-x-18-inch chart at the receiver end, which contains the two original charts electronically made into one.

ELECTRONIC "RINGER"

THE TELEPHONE of the future will have a different method of calling the customer's attention than the present clapper and gong arrangement. One proposed method would use a small loud-speaker in the instrument. This speaker would respond to a tone of a certain pitch which would be sent over the line. A big advantage would be decreased "ringing" power requirements. The speaker would require less energy than a bell.

This development will probably reach its greatest development with the advent of electronic switching. In the meantime, the inventors are busy figuring out ways to give you this feature now.

Patent No. 2,759,179 (Raymond J. Kircher, assignor to the Bell Telephone Laboratories) provides a method whereby regular ringing power can be sent on a line as is done now. The telephone, however, will accept this power as an energy source for a pair of transistors, which will generate an ac tone. This will sound through a loud-speaker and call the customer.



Electronic "ringer."

In the accompanying drawing, the transistors are numbered 16 and 23. Each is hooked into an oscillating circuit of which speaker 22 is a part. Frequency is determined by components 14 and 15 for one transistor and by 27 and 28 for the other. When 20-cycle ringing is applied to the line, one of the transistors, acting as a self-rectifying oscillator, produces a tone of about 500 cycles, which is emitted by the speaker.

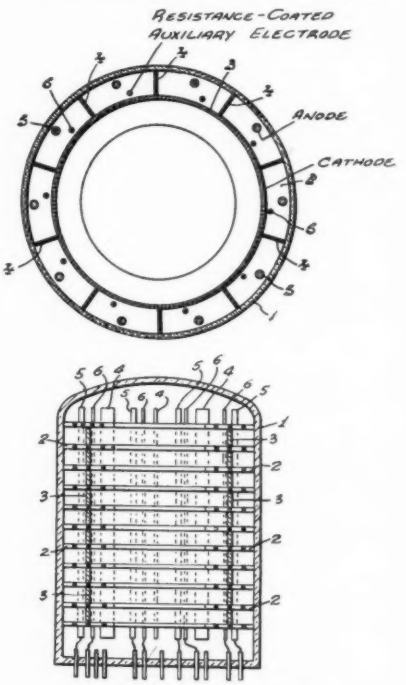
With two transistors, each can be tuned to a different frequency. The diode rectifiers 20 and 21 act as gates, and as the 20-cycle ringing current changes polarity, first one and then the other transistor will oscillate. This will produce a warbling note of two different pitches. The fundamentals will be enriched by many overtones which give the signals an "insistent quality" as the patent paper coyly states.

Typical values for the circuit shown are: C12, 0.5 mf; R13, 900 ohms; C14, 0.5 mf; and R15, 1000 ohms. Also, R27, 500 ohms; C28, 0.5 mf; and R29, 500 ohms.

MULTI-GLOW SWITCH TUBE

TELEPHONE men who know what a 100-point switch looks like would stare in amazement at a new tube developed by William Six and Jacobus Domburg of Eindhoven, Netherlands. This tube has a unique arrangement of 10 anodes and 10 cathodes, which can "fire" in a manner which will connect any one of 100 paths.

The tube is a glow-type, filled with rare gas. Its basic operation is something like that used in pres-



Multi-Glow switch tube.

ent tubes of the WE 313C or RCA OA4 variety. In these tubes, a potential is applied between the anode and cathode which is slightly below that required for the gas in the tube to conduct electricity.

A third electrode placed in these tubes is called a control anode. It acts as a trigger when it is energized, causing the gas in the tube to conduct. The conducting gas then closes the circuit between the cathode and regular anode.

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Thus, a tube of this sort acts as a single contact relay. The new tube is a 100 contact-device. Ordinarily if several electrons were placed in one gas tube, all would conduct when the gas became ionized. The new patent gets around this condition by coating the triggering electrode with a resistive or semi-conducting substance. Thus a voltage drop occurs on the electrode at the point where the tube fires.

Further, the arrangement of the elements is such that each potential "contact" is in sort of a compartment. Thus when the tube fires and conducts at one point, it will not automatically set off the other "contacts."

In accompanying drawings (Patent No. 2,757,307), "1" is the glass wall of the tube, "2" are mica washers dividing the tube into 10 levels; the "3's" are nickel rings which act as cathodes and also as spacers between the mica washers. The items marked "4" are mica barrier strips which run vertically through slots in the mica washers. This divides the tube into compartments. No. 5 identifies the rods used as anodes, and No. 6 the auxiliary or triggering anodes.

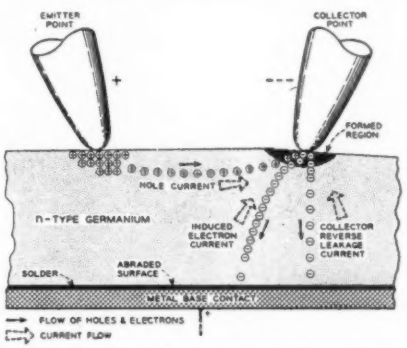
Each compartment of the tube as seen in the top drawing is a complete trigger tube in itself. There are 10 of these on each level, and 10 levels in the tube. This means 100 different paths or "contacts" can be closed within the tube.

TRANSISTOR ACTION

A NEW explanation of the behavior of the point contact type of transistor is contained in a recent issue of the "Bell Laboratories Record." The accompanying sketch shows that the transistor contains three current paths, and the collector current consists of the algebraic sum of these.

The first path is an electron flow from the base to the collector. This is called the reverse leakage current. This current flows even if no emitter current is present. Along this path the current flows as in a diode. Because the electrons in this path have a negative charge, the current they carry is shown as going in the opposite direction.

The second path is the route taken by the "holes" injected by the emitter. These holes carry a positive



This is how the current flows in a point contact transistor. **(From Bell Laboratories Record.)**

charge. As they approach the collector, they attract electrons from the base which is shown as the induced electron current. This latter path results in the amplifying action of the transistor. The induced current may be twice as large as the hole current which causes it.

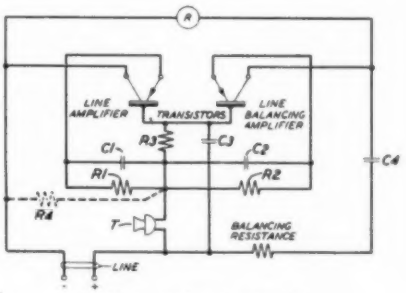
Another way of explaining the amplification is to note that the holes greatly decrease the resistivity of the crystal; hence the input resistance through the emitter point is low. The emitter is connected like a diode biased in the forward direction. The collector, on the other hand, is biased in the reverse direction—therefore is in a high resistance condition.

A typical transistor may have an emitter resistance of 200 ohms and a collector resistance of 10,000 ohms. Thus when the emitter current controls the collector current it is equivalent to a power gain of 50 times.

The "formed region" in the drawing is produced by sending a pulse of current into a newly made transistor. The exact nature and function of this region is still being explored.

NEW SUBSET CIRCUIT

SUBSCRIBER telephone circuits of the future will have a new look if Larned Meacham's invention is used. Mr. Meacham's patent (No. 2,762,-867), which has been assigned to Bell Laboratories, uses balanced transistor amplifiers to achieve anti-



New subset circuit.

sidetone and apparently does not require the use of an induction coil. Further, it will provide amplification for the transmitted voice.

In the circuit shown, the transmitter is connected to the two transistors in a parallel arrangement, to the two bases and the two emitters. The amplified output of the transmitter appears at the two collectors.

These collectors, if the transistors are matched, will supply equal and opposite potentials to the receiver; hence noise or the voice going into the transmitter will theoretically not be heard in the receiver.

On the other hand, the full output of the line amplifier transistor will be delivered to the line. The line balancing transistor and the balancing resistance are part of the anti-sidetone circuit. The purpose of the numbered resistors is to supply bias for the transistors; the capacitors are for by-pass purposes.

Typical values for the circuit may be: line impedance, 600 ohms; balancing resistance, 600 ohms; transmitter impedance, 300 ohms; receiver impedance, 1200 ohms; line voltage, 48 volts at central office; R1 and R2, 15,000 ohms; and R3, 3,600 ohms.

The capacitors are not assigned a value, but are described as large.

TRANSLATION BY MACHINE

TRANSLATIONS from one language to another can now be done on a word-for-word basis on high-speed general purpose digital computers, according to V. H. Yngve of the Massachusetts Institute of Technology. A word-for-word translation is the equivalent of looking words up in a dictionary or referring to memory and is suitable for many applications.

However, translation of this sort runs into the difficulty of multiple meanings of words. Often when a word has several meanings the correct one can be determined from the context of the material. In some cases the correct definition will be apparent from the position of the word in the sentence, or by its position in relation to other parts of speech.

A better means of translation would be on a sentence-to-sentence basis. Such a translation would come out in correct grammatical form, but the machine which does the translating would have to have a knowledge of the grammar of the languages involved. Such a means of translation is being studied at M. I. T. "but it will require a great deal of effort to work out the linguistic details," Yngve said.

THE GYRATOR

A NEW circuit element which violates the law of reciprocity has been called the "gyrator." Originally created for theoretical reasons, the gyrator has since been realized in different physical forms. Dr. H. J. Carlin of the Polytechnic Institute of Brooklyn recently presented a paper on this subject before the New York section of the Institute of Radio Engineers.

The most important applications of the device occur at microwave frequencies. Examples are transmission lines using ferrites which transmit on one direction only, duplexing circuits with hybrid properties and electronically variable power dividers.

Gyrator elements seem to have a future also in lower frequency devices. In the audio range the element has been approximated by the Hall Effect germanium crystal.

ELECTRONIC DEVELOPMENTS FROM HERE AND THERE

AN ARTICLE entitled "Electrical Measuring Instruments" which was written by J. H. Miller, vice president of Weston Electrical Instrument Corp., for the Encyclopedia Britannica is now available as a reprint.

Single copies may be obtained on request from the Editor of Weston Engineering Notes, 614 Frelinghuysen Ave., Newark 5, N. J. Ask for Weston Technical Monograph TM-101.

*

ELECTRONIC engineering is about to reach the grocery store. The Independent Grocers Alliance is about to try out a system which will combine electronics with conveyor belts. Customers will use a large metal key, which they will insert in a slot in the display cases.

The items selected will be totaled and packed into a carton automatically at the checkout desk. Sixty items can be assembled in 30 seconds.

*

ANYONE of Sylvania's 19 laboratories in the U. S. can be connected to a new data processing center recently installed in New York. Connection is by means of an 18,000 mile network leased from Western Union. In addition to the laboratories, any of the company's 45 factories and 54 offices can have the use of the giant Univac electronic brain in the processing center. At present the machine computes the payroll and issues the checks for the entire country-wide operation of Sylvania.

*

A NEW machine at Western Electric manufactures dry-reed relay assemblies automatically. Electronic controls continually check the results, causing the machine to correct its own errors as it goes along. Dry reed switches contain a sealed glass tube in which contacts must be positioned to within 5/10,000ths of an inch. The new machine makes switches 10 times faster and at one-twentieth of the cost of a manual production line.

*

ANOTHER use for the transistor has been found in a newly developed military lineman's test set. The usual magneto generator on these sets is connected into a rectifier and transistor oscillator. This changes the normal 20 cycles to 1,600 cycles, permitting the set to be used on lines which will not pass low frequency signals. The low power requirements of the transistor are well within the output capabilities of the magneto.

*

THE National Union Electric Corp. has been awarded a contract to make Skiatron dark trace tubes because of the increased demand. The dark trace tube can be used to retain a televised image on its face. It can be used for bank records, weather maps, signatures, etc., which have been transmitted over telephone lines.

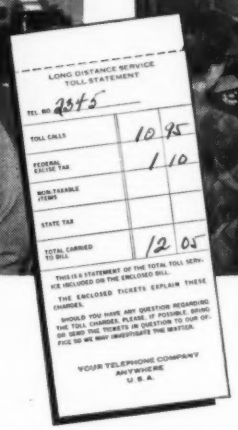
*

A SELF-SERVICING amplifier has been developed by a subsidiary of Paramount Pictures. Made to public utility specifications, the amplifier will give service even when tubes fail.

XUM

Ends posting 115,000 toll tickets per year ...cuts billing costs 50%

Mr. and Mrs. William Saltmarsh, who manage Lakedale Telephone Company, Annandale, Minnesota, show how a low-cost Recordak Junior Microfilmer quickly paid for itself.


LONG DISTANCE SERVICE
TOLL STATEMENT
TEL. NO. 2345
TOLL CALLS 10 95
FEDERAL EXCISE TAX 1 10
NON-TAXABLE ITEMS
STATE TAX
TOTAL CARRIED TO BILL 12 05
THIS IS A STATEMENT OF THE TOTAL TOLL SERVICE INCLUDED ON THE ENCLOSED BILL.
THE ENCLOSED TICKETS EXPLAIN THESE CHARGES.
SHOULD YOU HAVE ANY QUESTION REGARDING THE TOLL CHARGES, PLEASE, IF POSSIBLE, BRING OR SEND THE TICKETS IN QUESTION TO OUR OFFICE SO WE MAY INVESTIGATE THE MATTER.
YOUR TELEPHONE COMPANY
ANYWHERE
U. S. A.

Recordak Junior was the answer to rising clerical costs . . . an ever-increasing number of calls. No need to list each charge on the subscriber's bill. This tedious job is eliminated by taking pictures of the toll tickets, which are then sent out with an abbreviated bill. *Result:* Billing costs are reduced at least 50%. Subscriber questions are more than cut in half. *And no writing errors*—the film records are photographically accurate and complete; are filed at the finger tips—checked whenever needed on reading screen of Recordak Junior Microfilmer.

Bills look like this —only a few figures whether a subscriber makes one toll call or a hundred. Bill and 40 tickets require only three cents postage.

Anyone in the office can "double" as the Recordak operator—just press a button on this dependable microfilmer and you have a picture. Film costs are surprisingly low—under $4 per month.

The savings at Lakedale Telephone Company—with 2,250 subscribers—are typical of those enjoyed by more than 200 independent companies.

You should get the whole story soon—learn how you can rent a Recordak Junior for as little as $17.50 per month; buy one for as little as $550.

RECORDAK

(Subsidiary of Eastman Kodak Company)

originator of modern microfilming—and its application to telephone routines

"Recordak" is a trademark
Prices quoted are subject to change without notice

MAIL COUPON TODAY

RECORDAK CORPORATION (*Subsidiary of Eastman Kodak Company*)
415 Madison Avenue, New York 17, N. Y.
Gentlemen: Please send full story on Recordak Toll Billing System.

Name_____ Position_____

Company_____

Street_____

City_____ State_____

DEPARTMENT OF TECHNOLOGY
BUFFALO AND ERIE COUNTY PUBLIC LIBRARY
HH-11

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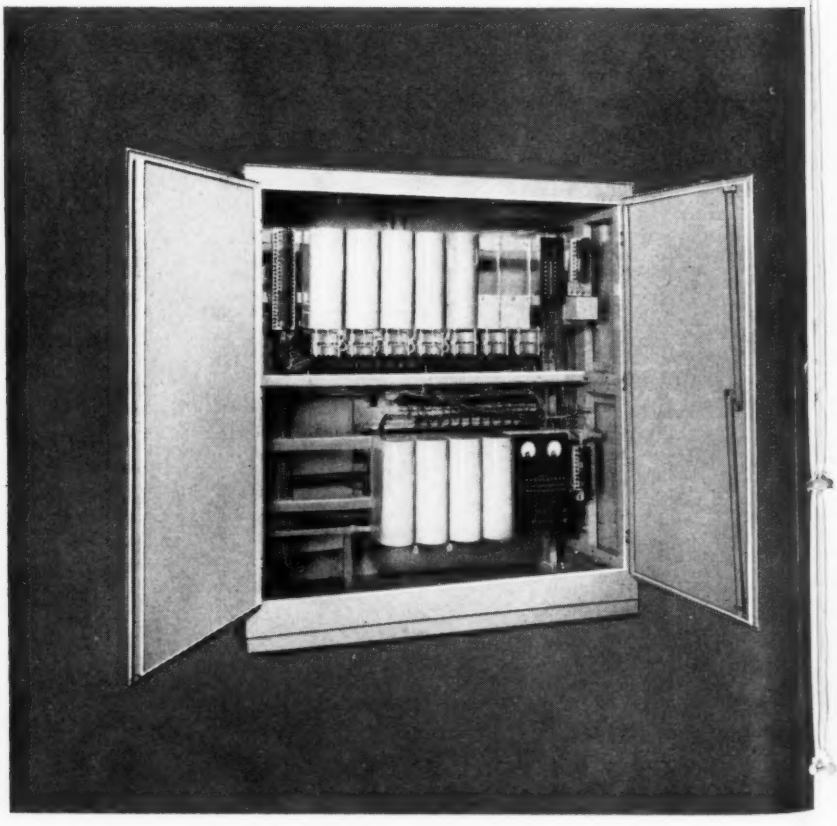
MISTER...

did you know—
Automatic now
offers you a...

NEW P-A-B-X...

serving up to
50 lines
at a...



XUM

LOW PRICE...

lower, even, than some competitive 40-line boards, and that you get...

FAST DELIVERY!

because it's available from stock? You didn't? Well—read on!

FACTS FOR THE FACTUAL-MINDED

- Automatic's new Type 25B P-A-B-X meets today's most popular service demand—25 to 50 telephones, 7 trunks, 10 links—and can expand beyond 50 stations if necessary. Convenient cordless attendant cabinet.
- Type 25B provides these standard modern services

—Group Hunting (calls automatically routed to an idle telephone in a group)

—"Meet me" Conference Service

- All these optional services, too!

Attendant Priority Service	PA Cut-in
Executive Key-calling	Code Call
Executive Direct-line	Night Transfer
Executive Right-of-way	Call Forwarding
Direct Line Service	Tie Lines
Secretary Answering	"Progressive Selection" Conference Service
Area Paging	"Fixed Group" Conference Service

Your P-A-B-X business future will be even rosier with Automatic's new Type 25B. It's just the size most of your customers need—and it's priced right.

We'll be happy to send you full details. Ask for new Circular 1815-A. Address: *Automatic Electric Sales Corporation, 1033 W. Van Buren St., Chicago 7. Or call HAymarket 1-4300.*

AUTOMATIC ELECTRIC

ORIGINATORS OF THE DIAL TELEPHONE

XUM

ABC of the Telephone

by Frank E. Lee

THE first section in this new series (TELEPHONY, Nov. 17) discussed the planning of additions to the outside plant. This section covers laying out the pole line, grading requirements, and a résumé of clearances to be observed in outside plant construction.

PART 76. OUTSIDE PLANT CONSTRUCTION—Section 2. The preceding article in this series appeared in the Nov. 17 issue, page 19.

Laying Out the Line

In the actual laying out of a pole line, the location of each pole is pinpointed along the route in advance of being placed. In this way all the factors of terrain, area to be served, span length, storm loading, and similar items are brought together with a high degree of precision. The success of this part of the job depends upon the ability and accuracy of those who are assigned to staking the line.

To stake a pole line, a team of at least three persons studies the route and drives a stake where each pole is to be set. In most instances, the stake will be marked to specify the type and length of the pole to be used. When a guy wire is required, the type of anchor and its location may also be shown on the stake.

The equipment required to stake the line depends upon the terrain through which the line is to be placed. In flat or gently rolling country, range poles can be used to advantage to sight along the line. The operation is relatively simple and consists of establishing three or more points to form a straight line. Starting at point A in *Fig. 1*, points B and C are located before the range pole at A is moved forward to point D. By progressively moving the last range pole forward, while the other two are held in position, a straight line can be established.

Where corners are required, the same procedures are followed. The only difference is that, once located, the corner stake becomes a new starting point as the line continues along the new tack, as shown in *Fig. 2*.

When crossing a hill, it may not be possible to move each successive range rod a full span forward. Instead intermediate sighting points may have to be established as the staking operation crosses the crest of the hill, see *Fig. 3*. As the direct line route over the hill is established the stakes can be driven at the predetermined span spacing.

Occasionally, the location of pole A and pole B may be established on either side of a hill with the objective of plotting a straight line between the two, as illustrated in *Fig. 4*. Because of the height of the hill, range rod A cannot be seen from the location of range rod B. In this instance two additional sighting points are needed.

Range rod C is placed where it can be seen from the location of rod A. Range rod D is held where it can be seen from rod B.

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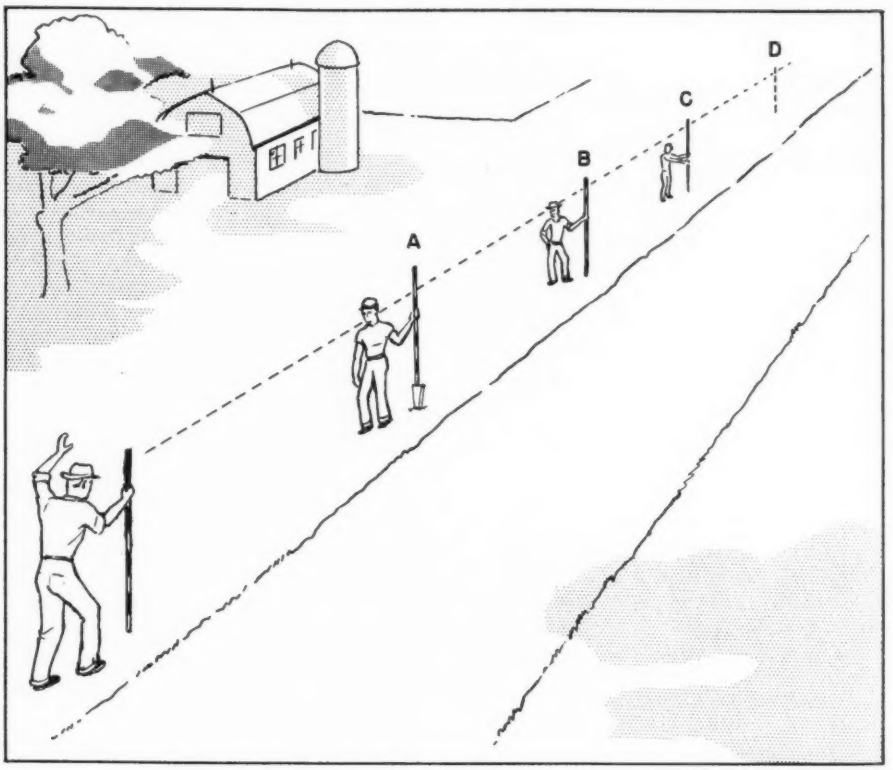

Fig. 1

XUM

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A steel tape line can be used to measure the span length spacings between any two marker stakes. As mentioned previously, range rods may be satisfactory to lay out a pole line route over level or gently rolling terrain.

However, the use of range rods alone may prove difficult over rough country, or where a line must leave a highway right-of-way at one point and re-enter the right-of-way at a definite point further along the line.

Under these conditions there are advantages to hiring a surveyor to mark the route along which the stakes are to be placed. The important requirement is to set up sufficient markers to facilitate the use of range rods in locating each pole stake.

A transit is a good investment if a line of 10 or more miles in length is to be built. On level runs, a number of stakes can be placed by sighting through the transit, set up at one location. From a hilltop transit position, stakes can be set up across a valley. The problem of laying out a straight line over a hill between two points on either side is simplified with a transit.

As shown in *Fig. 5*, the transit is set up on the top of the hill approximately in line with stakes A and B which are visible in either valley. By taking a sight on stake A and swinging the transit 180 degrees and sighting at stake B, a transit operator can determine if the transit is in line or to the left or right of a straight line between A and B.

After the first sight between A and B has been made, the transit can be moved until it is exactly in line with A and B. This procedure usually is much faster than when range rods only are used, as illustrated in *Fig. 4*.

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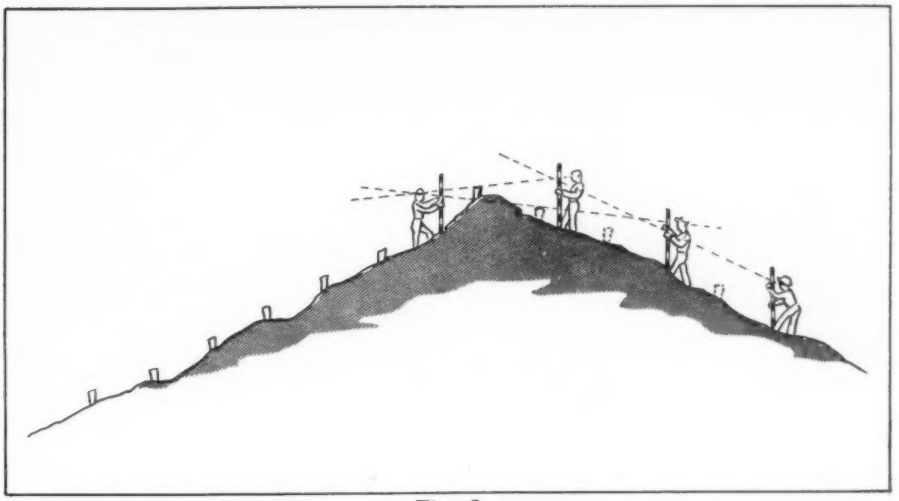
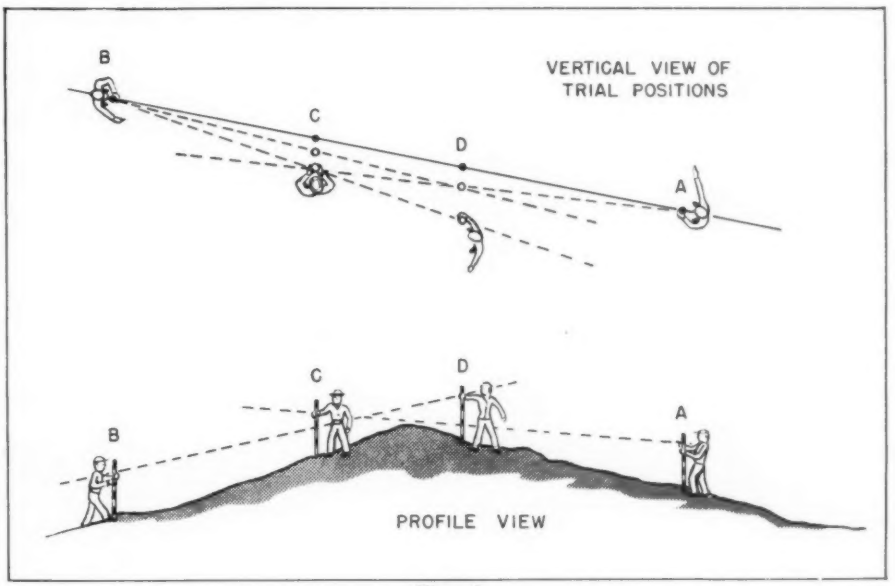


Fig. 3



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Along any line route, there are certain fixed obstacles which will have a definite bearing on the location of the various poles. Typical obstacles are highways, rivers, buildings, and similar obstructions. These fixed obstacles must be considered in laying out the pole line. One way to do this is to first measure the distance between two fixed obstacles and divide the distance into an equal number of spans of about the desired length.

This procedure, of course, would apply only to relatively short sections of about a half a mile. In longer sections some degree of span length adjustment is required only if a span to a pole at a fixed location is 10 per cent over or 20 per cent under the established span length. In other words, longer sections can be staked progressively, adjustments for fixed pole locations being compensated in the adjacent eight or 10 pole locations.

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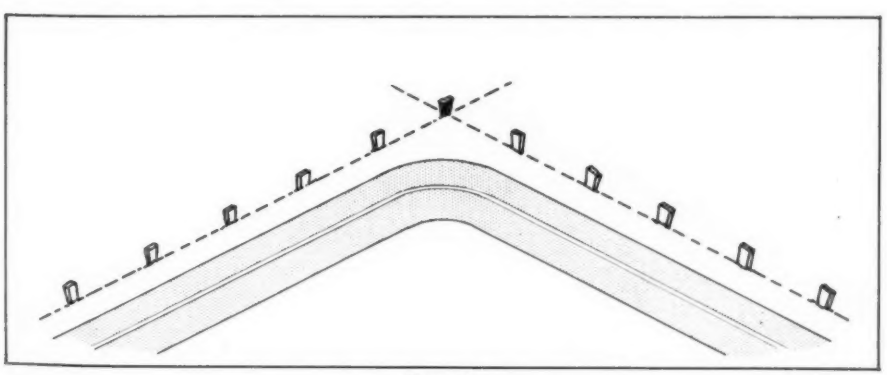

Fig. 2

A B C of the Telephone

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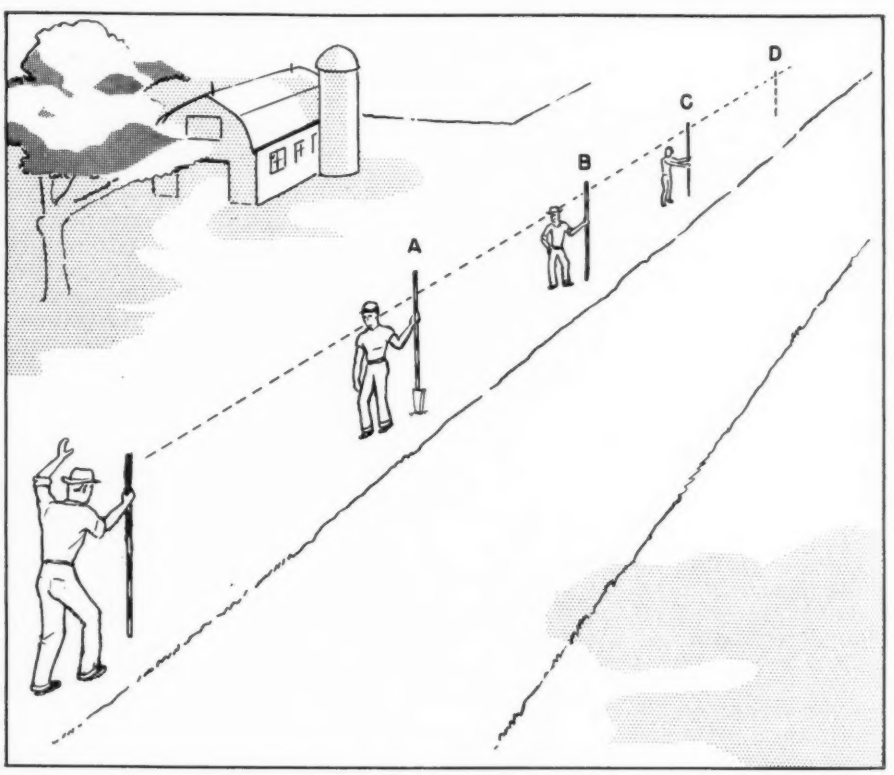

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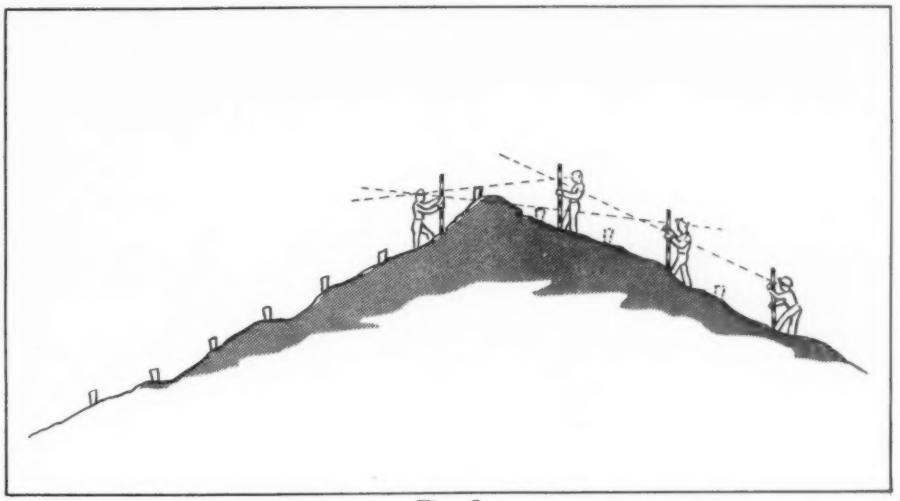
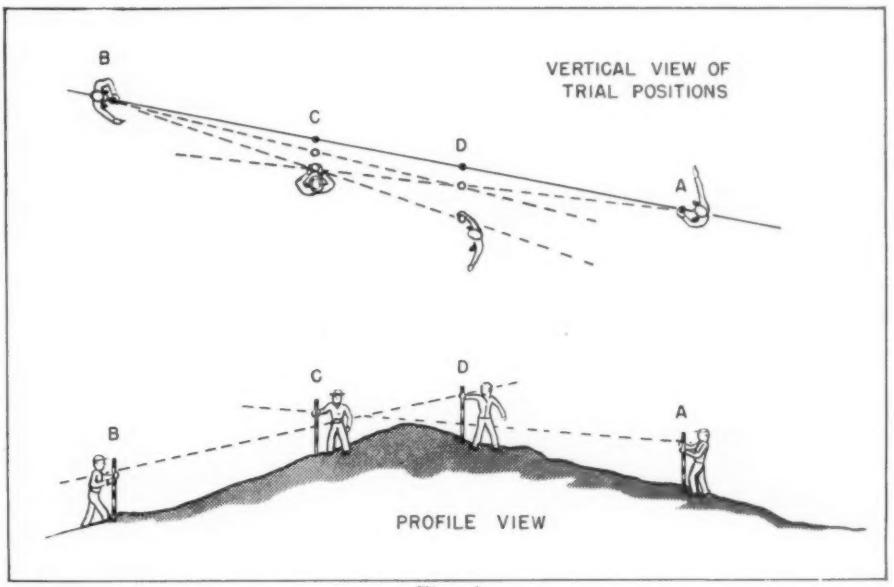


Fig. 3



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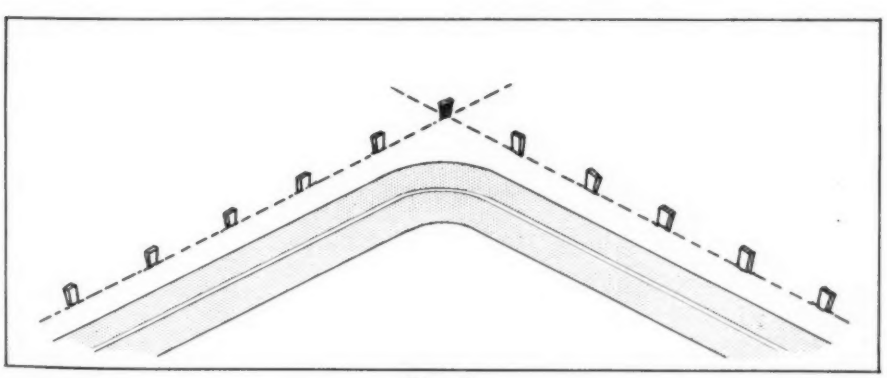


Fig. 2

XUM

in a gradual curve section usually are placed in a straight line.

(5) Poles seldom, if ever, are set between a highway and a drainage ditch. In view of materials that will permit long span construction, there seems to be little reason why such a potentially dangerous location would have to be selected.

(6) Along public rights-of-way a minimum distance of 5 feet from the edge of the right-of-way will prevent the line from overhanging private property. However, if the right-of-way is secured along private property adjacent to the public right-of-way the reverse of this situation would apply.

(7) Poles of more or less uniform length can be used if pole locations on top of mounds or in ravines or sharp depressions are avoided. In this respect the grade of the line can be maintained without using extremely long or short poles.

Grading and Clearances

When a pole line is completed the open wire or cable should follow the contour or grade of the earth over which it passes. This means that as the grade of the ground rises and falls the line will have a similar grade, as shown in *Fig. 6*. That's how the term "grade" came to be applied to pole lines.

As a line crosses a hill the grade may become relatively steep. This will place a side thrust on a cable support, as well as the downward gravitational pull caused by the normal weight of the plant being supported. On cable lines, grade clamps are used to hold the cable in position under these conditions.

Usually limitations are set on the amount of change in grade that may be made in a span. If the span is 150 feet or less, the change in grade may be limited to 4 or 6 feet. For spans longer than 150 feet, 8 feet may be permissible.

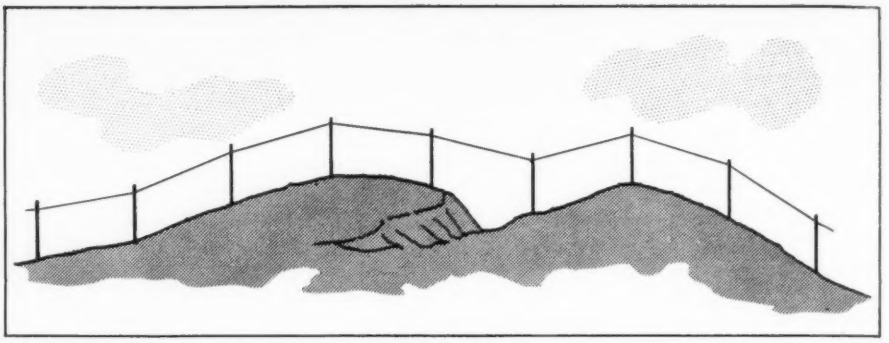


Fig. 6

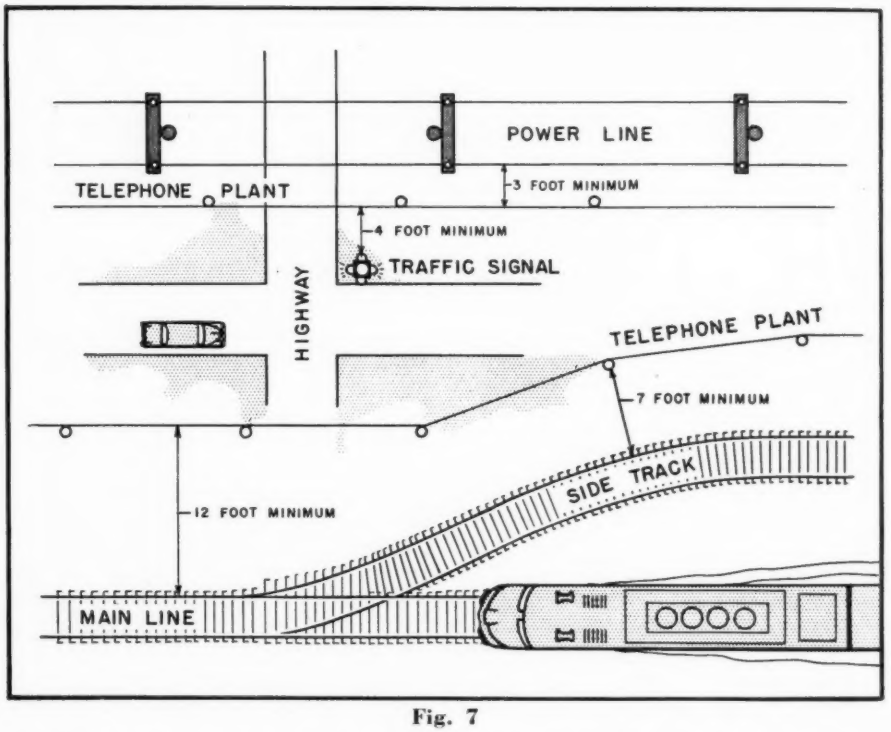


Fig. 7

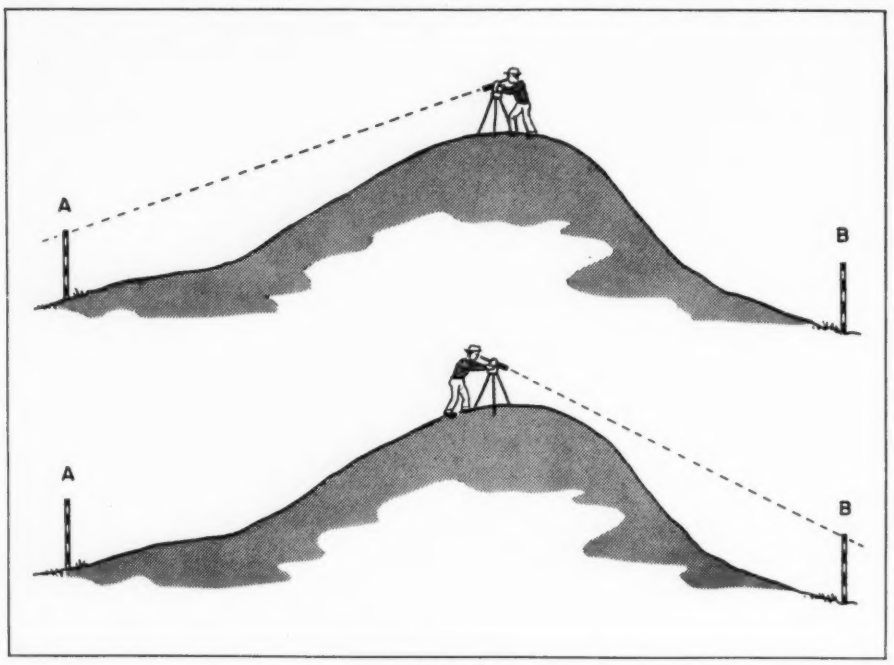


Fig. 5

In mountainous or rugged country the limitations on change of grade usually are exceeded to avoid excessive construction costs. When the change in grade, which amounts to change in horizontal pull at the pole attachment, is twice the specified amount the poles affected should be equipped with double crossarms. This will add to the horizontal folding factor of the pole attachments.

The nominal height of a given pole will be determined by the clearances required along the route. Changes in the nominal height will be necessary where highway crossings, railroad crossings, trees, and similar obstructions, are encountered.

In most instances, poles and pole locations are selected to provide just a little more than the required minimum vertical clearances. However, there is no need to go to the extra expense of providing a substantially greater clearance than the accepted minimum.

The important thing is to be sure

(Please turn to page 37)

XUM

NUMBER 17
Toll grade. These insulators are employed for all exchange circuits and for all toll and trunk circuits that do not exceed ten miles.

Dependable ...in emergencies

Dependability is the story of Hemingray insulators. On the line, you can depend on their strength and uniform high quality . . . when you order, you can depend on prompt delivery of what you need, when you need it.

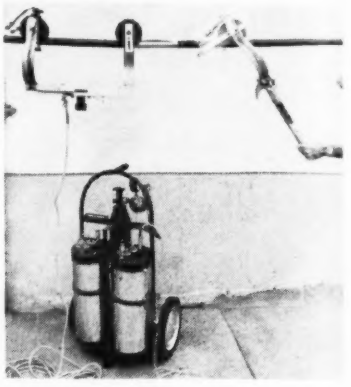
Since 1870, Hemingray insulators have been the standard for quality on telephone and telegraph lines the world over. Dependable Hemingray Glass insulators today carry most of the world's overhead telephone and telegraph lines . . . play a major part in helping to maintain our highly dependable communications systems. These insulators are a product of Kimble Glass Company, subsidiary of Owens-Illinois, Toledo 1, Ohio.

HEMINGRAY INSULATORS
AN (I) PRODUCT

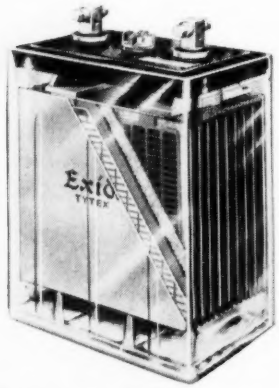
OWENS-ILLINOIS
GENERAL OFFICES · TOLEDO 1, OHIO

IT'S KELLOGG FOR T

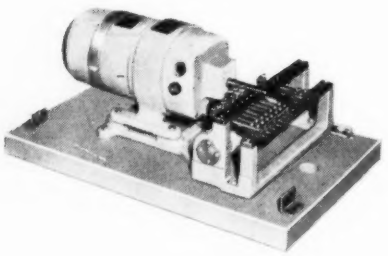
You're sure of top-flight quality with Kellogg line supplies . . . every item has been put through the most rigid performance tests and delivery is fast . . . Kellogg has 7 warehouses and more than 100 distribution points across the nation.



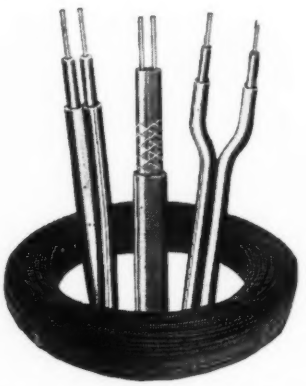
Cable Leak Detector — Two models are illustrated. Model at left is for high cables. Nozzles spray cable, air pressure from tanks causes air bubbles clearly seen from ground. S&G MFG. CORP.



More Power, Less Space—The Exide-Tytex battery requires only one-half to two-thirds of the space needed by the conventional cell. Permits smaller racks in new installations. Exide Industrial Division, THE ELECTRIC STORAGE BATTERY COMPANY.



Ultimate in Maintenance-Free Rotary Equipment –The Tone Alternator Interrupter Unit produces clear, unchanging tones of 500 cycles and 600/120 cycles for dial and busy tones. Made by HOLTZER-CABOT TELEPHONE EQUIPMENT DIVISION, National Pneumatic Co., Inc.



Long Service Life and Low Plant Costs go hand in hand with the installation of ENDURPRENE — The Neoprene Drop Wire available in both Copperweld and Bronze. This flexible and easy-to-handle wire is made by GENERAL INSULATED WIRE WORKS, INC.

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Developed for Better Insulation, simplified installation and testing, the Cook Testerm Drop Wire Connector occupies less space and improves connecting methods of subscriber drops to open wires. Low in cost and upkeep. Made by COOK ELECTRIC COMPANY.

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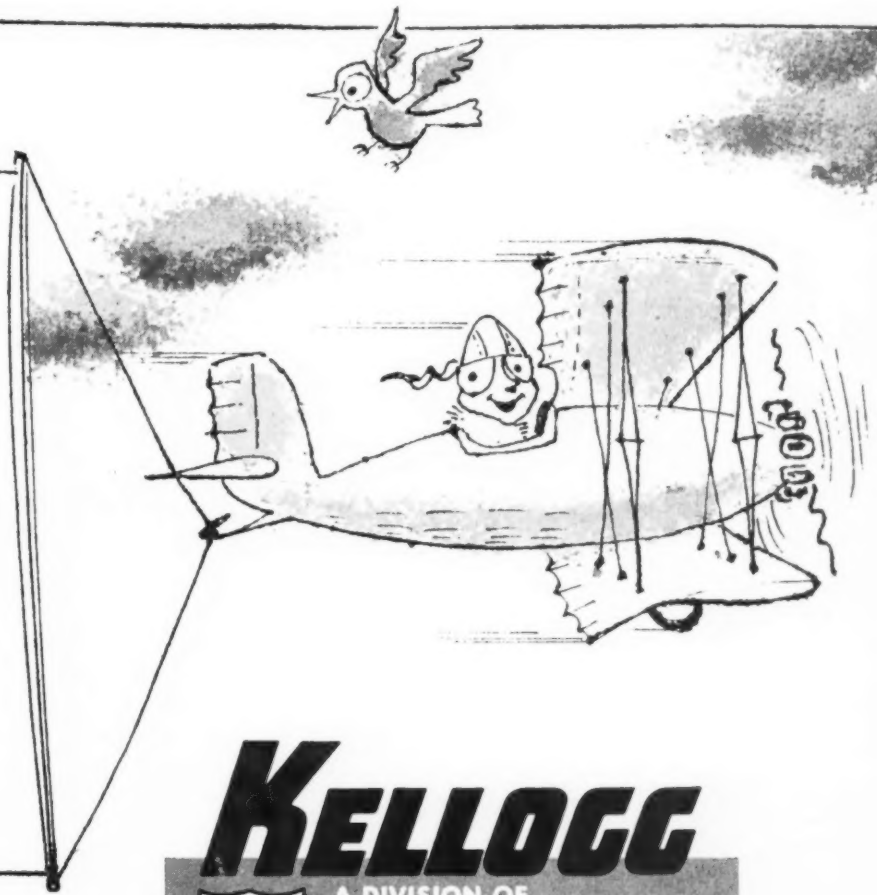
Lighter, Last Longer, Cost Less to Install. New Roebling telephone cables and wires are completely insulated and sheathed in modern plastics. Flexible and easy to handle. Up to 404 pair, in sizes 19, 22, or 24 A.W.G. conductors. JOHN A. ROEBLING'S SONS, CORP.

Preformed Plastic Line Guards. Ideal for protecting covered cables or conductors from abrasion by trees or other objects. Fit securely like metal line guards—are easily installed. PREFORMED LINE PRODUCTS COMPANY.



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- Terminal saves money
- Pennies for power

Published every week to help you get the most out of your materials and supplies dollar

by John W. Garbutt, Order Editor—Rochester

As a volunteer fireman I have to be alert at all times, just as Stromberg-Carlson is always alert to meet your supply needs. We're "on the job" for you 24 hours a day—because telephony is our full-time job, not just a sideline. Every order we fill for you brings you fine products, protected by a double guarantee —ours, and the maker's. And the attention given to your order is as careful as if our total program depended on it—because it does! Your supply business makes possible the research program that discovers new and better telephone equipment—to serve you. It's a pleasure to be working with you—we sincerely appreciate your support!

Here's a drop wire that hides its age

Samples of Teleprene® (neoprene jacketed) drop wires were strung where they would get lots of weather. After nine years, they still looked fresh and undaunted—and tests showed that these wires would give years and years **more** of good service!

The jacket is a tire-tread type neoprene compound which provides excellent resistance to sunlight, abrasion, oils, acid fumes, alkalies and other corrosive chemicals.

Conductors have Teleplate coating: lead, to resist corrosion, and brass plating over the lead, to provide enduring adherence of the high quality buna rubber insulation to the conductor.

Available in parallel (shown here), twin parallel and twisted pair types.

Direct burial cables save cost of underground ducts

Ansonia manufactures cables for direct, ductless burial, thoroughly armored to provide the mechanical protection you need for dependable telephone service.

Ankoseal Type 775-AP Direct Burial Cables offer you the added protection of two .013" aluminum alloy flat armor tapes, plus an overall jacket of Ankoseal plasticized PVC over the standard Type 775-P Cable. The armor tapes give additional shielding.

Layers of protection make Ankoseal Direct Burial Cable ideal for low-cost underground placement of outside cable plant.

With its flexibility and light weight, Ankoseal Direct Burial Cable permits quick placement in trenches or by means of cable plows with small crews.

High-speed splice outlasts the wire itself

You can cut half the time off splicing wires—and get a splice that will actually outlast the conductor itself!

Available for all types of wire: Nicopress sleeves. Special Nicopress tool is easy to use.

Because it is stronger than the rated breaking strength of the wire, you just can't pull apart a joint made with the Nicopress sleeve. It will withstand the toughest strains of vibration, yet makes a neat, compact splice that you can use on drop or inside wires as well as other lines. A tough inner alloy lining—harder than either the sleeve or the conductor—is the secret of Nicopress sleeves' strong grip.

To apply Nicopress sleeves quickly and simply, use the Nicopress tool, which is specifically designed to work together with the sleeves for high-speed splicing.

Designed for economy

That's the way to describe the New "Stranterm" cable terminal, the most flexible terminal ever developed. The Stranterm is primarily strand-mounted, but may be pole-mounted. The stub may be taken out of either end of the terminal and can be either lead or plastic cable. The core section is gas-tight and moistureproof; the terminal may be protected, **even after installation,**

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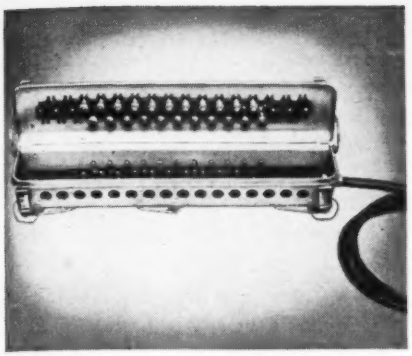
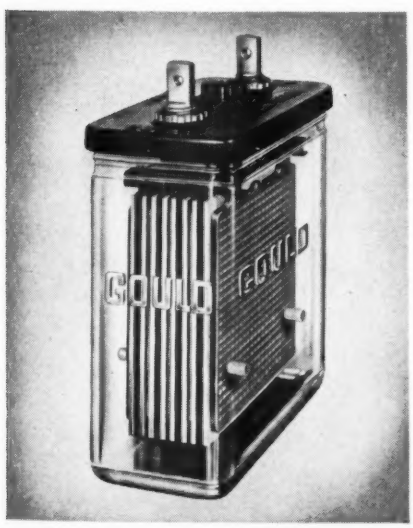


Strand-mounted cable terminal.

either fully or on a pair-by-pair basis by the addition of Cook's "snap-in" Mini-Gap arresters. The 11 and 16 pair core assemblies are interchangeable and replaceable; and drop wire openings are completely sealed by an exclusive grommeting arrangement. Manufactured by Cook Electric Company in 11, 16 and 26 pair sizes, with 3½ foot cable stubs.

Battery has lowest yearly cost

There's an easy way to save money on switchgear, signal and alarm systems or emergency light and power applications.



Gould Planté rolls up excellent service records—cuts maintenance to a minimum.

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that the required clearance is provided. A clearance of less than the minimum, even of only a few inches, should not be tolerated.

All cost factors favor doing the job right when the line is built, instead of going back at a later date to rebuild a plant that does not provide the necessary clearance.

As a general rule, the clearances recommended in the National Electrical Safety Code are used as standard clearances. However, local codes may be established which supersede the national code. Where this condition occurs the local code must be observed. The National Electrical Safety Code, with regard to aerial telephone plant, specifies horizontal clearances as follows:

Horizontal Clearances	*Horizontal Clearance in Feet*
Trolley feeder or power wires	3
Signal Pedestal	
Traffic signal, railroad signal, automatic gate and similar pedestals	4
Nearest rail of railroad side track	7
Nearest rail of main line railroad track	12

(Illustrations of these clearances are shown in *Fig. 7.*)

Telephone plant should always be placed below power wires. Where the use of existing poles will not permit this arrangement of wires, the power line and telephone plant should be redesigned and rebuilt to secure the proper clearances and to maintain the required wire arrangement, according to the following table:

Foreign Wires		Vertical clearance in Feet for Telephone: Wires & Cable	Vertical clearance in Feet for Telephone: Guys	Remarks
Line Wires	0-300 V to ground	4	2	Note 1
	300 V to ground to 750 V between wires	4	2	Note 2
	750—8700 volts	4	4	Note 2
	8700—50,000 volts	6	4	Note 2
Service Drops	0—750 volts	4	2	Note 3
	750—8700 volts	4	4	Note 3
Supply Cables	Permanently grounded continuous metal sheath, all voltages	4	2	Same clearance as open power wires of same voltage as cable
	Other types			
Guys to Power Poles		2	2	
Foreign Communication Wires	Similar construction	2	2	Note 4
	Used with electric power or trolley system	4	2	

Notes:

(1) A clearance of 2 feet may be permitted where the power conductor is above the communication conductor. This is, provided that the crossing is not within 6 feet from the pole concerned in the crossing and the voltage to ground does not exceed 300 volts.

(2) Increase the 4-foot clearance to 6 feet where the crossing is within 6 feet of any pole concerned in the crossing. An exception to this rule is made for guy wires.

(3) Two-foot clearance is allowable for wires installed above or below service drops. Cable always must be installed below power service drops.

(4) This separation may be reduced by mutual consent, providing the wires and cables involved are not associated with a fire alarm, railway or telephone system of a power company.

(To Be Continued)

GENERAL TELEPHONE CO. MAKES USE OF

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The people of General Telephone Company of Illinois are men with a lot of line work experience. Several of their trucks are now equipped with Tel-E-Lect diggers and derricks.

Tel-E-Lect derricks are simple to operate even by one man . . . self-storing for over-the road travel . . . ruggedly built for long life service . . . compact to conserve valuable truck storage space.

For years we've been telling telephone and power companies about our complete line of pole hole digging and pole setting equipment . . . "A" and "T" Frame Derricks for front or rear operation by either mechanical or hydraulic control . . . mechanical and hydraulic diggers . . . drive systems . . . and custom utility truck bodies. If you'd like more information and literature write:

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Name USITA Subcommittee On Engineering Education

The United States Independent Telephone Association has announced that Donald C. Power, president, has appointed a Personnel subcommittee on Engineering Education.

Its duties are to establish and guide, at a recognized college or university, an educational seminar of a self-sustaining type for established engineers and management personnel interested in furthering an appreciation of engineering subjects.

The subcommittee, which also will serve as an advisory committee to the faculty of such educational institution to the extent deemed necessary, is composed of Paul H. Henson of Lincoln, Neb., chairman; Russell J. Loveland of San Francisco, Cal., and Frederic E. Norris of New York, N. Y.

USITA's immediate past president, M. M. Hale, had appointed a special task force committee (TELEPHONY, Sept. 15, p. 32) to "investigate the desirability of establishing a technical seminar for (Independent) telephone engineers along the lines of the management courses offered at several of our universities."

This action, according to USITA, was taken in recognition of the ever-increasing need for engineering and management personnel to be versed in the broad technological aspects of telephony. The seminar, as then visualized, would be designed to better equip experienced engineers and operating supervisors to discharge management responsibilities by discussions of new, as well as time-proven, techniques and methods of telephone engineering.

Members of that committee were Mr. Henson, M. L. Donaldson of Tampa, Fla., and Mr. Norris.

Named Head of Kan. Company

T. J. McCrary has been named manager of the Lewis (Kan.) Telephone Exchange, it was reported on Oct. 29.

For the past eight years Mr. McCrary has been manager of the Elkhart (Kan.) Telephone Co.

Approves Kan. Dissolution

Dissolution of the Elmont (Kan.) Mutual Telephone Co. was approved on Nov. 9 in Topeka by District Judge Beryl Johnson. P. H. Netherland was the receiver.

Asks to Incorporate in Mo.

The Monroe Telephone Co. on Nov. 1 asked the Missouri state corporation department for authority to incorporate and issue 500 shares, no par value.

XUM

REA Names Spivey Information Chief

Appointment of William E. Spivey, Arlington, Va., as chief of the information services division, Rural Electrification Administration, was announced on Nov. 1 by Administrator David A. Hamil.

Mr. Spivey has been acting chief of the division since August. He has been

W. E. SPIVEY

with REA's Information staff since Mar. 2, 1945, serving as head of the current information section for the past three years.

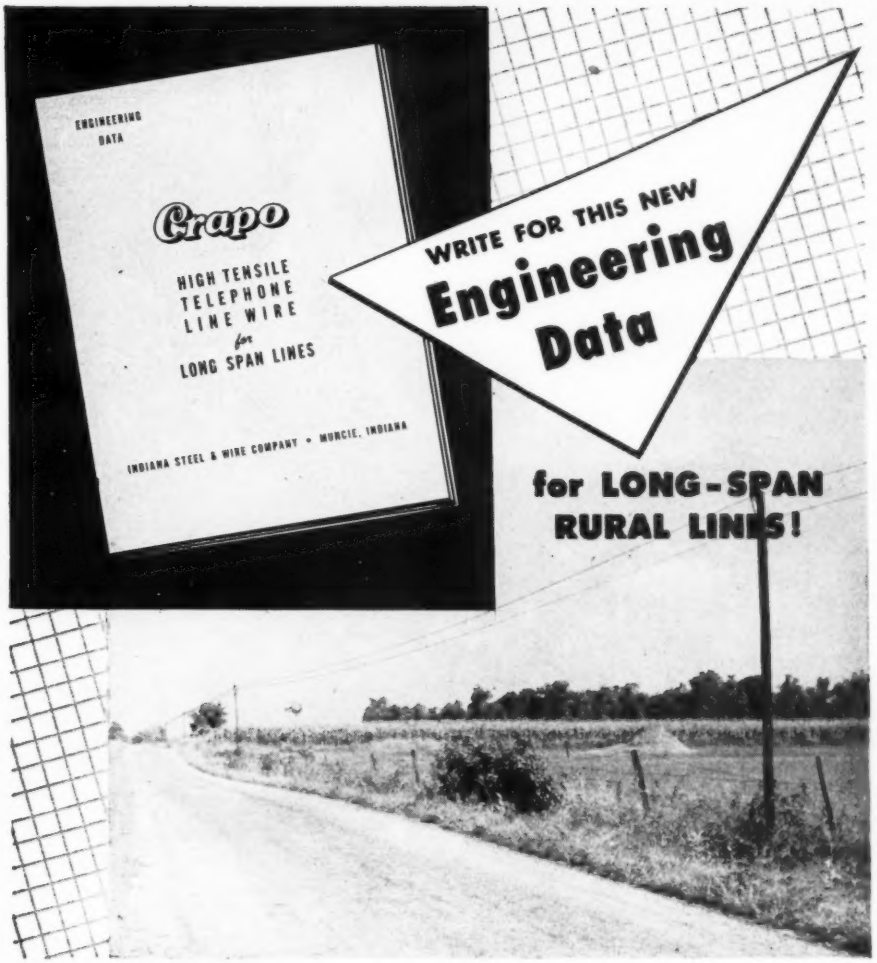
REA's new information chief was born in Illinois. After graduation from the School of Journalism, University of Illinois, he worked on St. Louis, Mo., newspapers. He served as news editor of the East St. Louis (Ill.) *Journal* before joining REA during its wartime stay in St. Louis.

Spivey worked closely with REA borrowers in about 30 states during the post-war expansion period and gained close acquaintance with the personnel and activities of the rural electric systems. He has also given increasing attention to informational needs of the developing rural telephone program.

Plan Safety Glasses for NE T&T Outdoor Employes

Outdoor employes of the New England Telephone & Telegraph Co. in Rhode Island all will be wearing glasses soon, it was reported on Nov. 17.

The company announced its outdoor employes will be fitted with safety glasses to prevent eye injuries. Those who wear glasses will get lenses according to prescription. The others will get plain glasses.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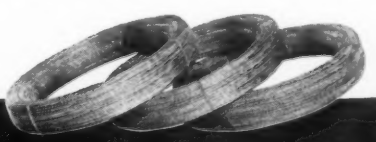

INDIANA STEEL AND WIRE CO., MUNCIE, IND.

Courts and Commissions

N. C. Superior Court Hears Durham Telephone Appeal

An appeal of the Durham Telephone Co. from rulings of the North Carolina Utilities Commission granting rate increases estimated to bring in an additional $96,667 a year, as opposed to a total of $201,000 requested, was heard by Superior Court Judge Q. K. Nimocks on Nov. 12-16 (TELEPHONY, Sept. 15, p. 33).

After hearing the reading of the evidence presented before the commission, and arguments of counsel for the company and the city of Durham, which has been opposing the increase, he asked both sides to submit briefs "as early as possible, and not later than Dec. 1," and said that he would not reach a decision in the case before the latter part of December.

Durham Telephone in appealing the commission orders contends its rates long have been lower than in other areas of the state, and that even if it had received the total $201,000 asked, the rates still would be lower than in other sections.

The company contends that the commission erred in its original decision May 28, and in overruling the company's objections on Aug. 28, on the following points: (1) The value of the company property; (2) the rate of return it should be allowed (the commission set a 5.81 per cent figure while the company sought 6 per cent); (3) considerations due to the company for financial losses for directory advertising, and (4) the company's claim that it should be allowed to write off, over a five-year period, $80,000 spent in preparing its rate case.

AT&T Seeks $38,000,000 More Long Lines Facilities

Authority to build additional communications facilities at a cost of 38 million dollars was sought from the Federal Communications Commission on Nov. 1 by the Long Lines Department of American Telephone & Telegraph Co. and 13 other Bell System companies.

Covered in the application was installation of 3 million channel miles of long distance telephone facilities, and 2.8 million channel miles for teletypewriter service, as well as audio facilities for radio and television networks. Construction was proposed for next year, and would constitute an important part of Long Lines' 1957 program for new facilities.

The application said that the additional circuits are needed to meet a continued increase in communications traffic. Long distance telephone calls, up about 10 per cent this year from 1955, are expected to rise 6 per cent in 1957. Teletypewriter exchange messages (TWX), up 7 per cent this year from 1955, are expected to rise 10 per cent in 1957.

Authority was requested not only to broaden the message capacity over existing open wire, cable and radio relay routes, but also over new routes where necessary. The activity would cover practically all sections of the nation.

Grants Oregon Stock Issue With 10% Commission

A Sunnyside Telephone Co. 75,000-share $1.00 par common stock issue was authorized on Nov. 2 by the Oregon Public Utilities Commissioner, with the additional authorization that it be sold through a securities dealer with a sales commission of 10 per cent.

In the order, the commissioner stated:

"Because of the present depressed condition of the securities market nationwide, it is difficult to secure sale of corporate securities. For a relatively small issue such as that proposed by the Sunnyside Telephone Co., it is substantially impossible at the present time to secure underwriting.

"Therefore, applicant (Sunnyside) believes and states that it is to the best interests of the applicant that it be permitted to sell through a securities dealer on a best efforts basis 75,000 shares of unissued common capital stock of the 100,000 shares authorized

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Can Now Identify Non-Working Cable Pairs 3 times faster than 2 men working together.

DISTANCE: 2 feet to 40 miles

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The Combination Tag-and-Terminating Board, showing cable pairs properly connected. Tips — Horizontally. RINGS—Vertically.

The NEW MODEL CMUW

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for sale under the terms of Order No. 33795, as entered upon the original application herein (TELEPHONY, June 11, 1955, p. 40), at a brokerage fee of ten per cent (10%) of the value of the shares to be sold, and applicant states that it does not believe that it is possible to sell such shares at any lesser cost."

Ill. Bell Gets Permission To Buy Independent

The Illinois Bell Telephone Co. has received authority to acquire the Forest City Telephone Co. at San Jose, Ill., it was reported on Nov. 14 (TELEPHONY, Apr. 28, p. 62).

Permission to purchase the Independent exchange was granted on Nov. 9 by the Federal Communications Commission.

Bell in Wisconsin Seeks Increase in Rates

The Wisconsin Telephone Co. has asked the Wisconsin Public Service Commission for an unspecified rate raise because of increased wage, operating and construction costs, it was reported on Nov. 15.

The company will recommend a definite increase if the commission grants its request for an investigation of operations and a hearing. Current rates were established in 1952.

Recently a wage increase of 2¾ million dollars was granted, according to Charles E. Wampler, company president.

In addition to the recent wage increase, Mr. Wampler said salary raises for 1953, 1954 and 1955 totaled 4.3 million dollars a year.

Michigan Bell Petitions For 5% Revenue Increase

The Michigan Bell Telephone Co. filed a petition on Nov. 16 with the Michigan Public Service Commission for an intrastate rate increase calling for a 5 per cent rise in company revenues.

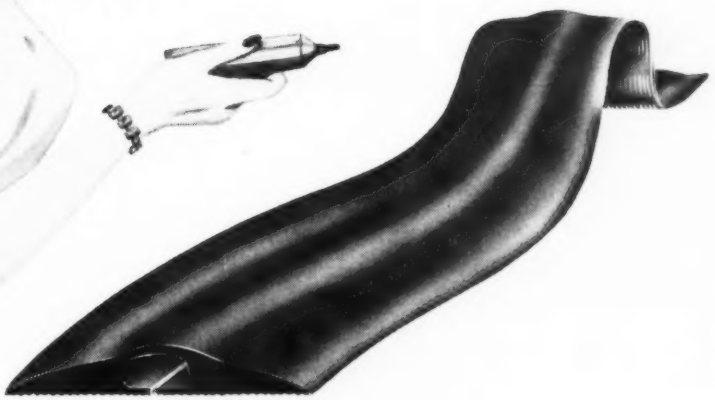
William M. Day, Michigan Bell president, said the increase "is needed to cover two upward wage adjustments for company employes and other increased costs."

Mr. Day also emphasized the company "is taking the opportunity at this time to ask for re-balancing of its rate schedules to reflect the growing value of service in growing communities. Existing rates are based upon a telephone census of 1948."

The requested revenue increase would approximate 12½ million dollars a year, 52 per cent of which would go to the federal government in taxes.

YES!

ANYONE CAN INSTALL



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Since the last rate adjustment, Mr. Day said the company's total wage costs have gone up 13½ million dollars a year—6.3 million dollars in 1955 and the 7.2-million-dollar pay increase of last month. Nearly 10 million dollars of these added payroll costs, he said, are applicable to the company's intrastate services and should be covered by rates for such services. He pointed out that other costs of doing business also have gone up, such as taxes, materials, and supplies.

"Our request would need to be substantially higher if we had not realized significant economies in operating the business," Day said.

Day stated the company's return on investment had dropped from 6.40 per cent in 1955 to 5.98 per cent for the first nine months of 1956 and that the return would be depressed further this year by the recent wage adjustment.

While operating revenues have climbed 10 per cent over last year, he said, operating expenses have gone up 13 per cent and the average investment per telephone has continued to climb.

"Michigan Bell," he said, "is not now earning and cannot earn a fair return with existing rates."

Minnesota Company Gains Raised Rate Schedule

The Minnesota Railroad & Warehouse Commission on Nov. 5 granted authority to the Sherburne County Rural Telephone Co. to make rate changes at its Big Lake, Becker and Zimmerman exchanges.

Operating revenues for the company are to rise from $29,071 to $37,831, and net operating income from $5,227 to $8,819, a 5.94 per cent return on a plant fair value of $148,557. Old and new gross rates are:

	Big Lake, Becker and Zimmerman	*Glendorado*
OLD		
Business		
One-party	$4.00	
Two-party	3.50	
Rural multi-party (choice of instrument)	3.25	$3.25
Rural multi-party (wallset)	3.00	
Residence:		
One-party	2.75	
Four-party (choice of instrument)	2.50	
Four-party (wallset)	2.25	
Local multi-party	2.00(a)	
Rural multi-party (choice of instrument)	2.75	2.75
Rural multi-party (wallset)	2.50	
NEW		
Business:		
One-party	$4.50	$6.25
Two-party	4.00	5.50
Rural multi-party	3.75	4.25
Residence:		
One-party	3.25	4.75
Two-party	3.00	4.50
Four-party	2.75	3.75
Rural multi-party	3.00	3.00

Mileage charge: 50 cents for each ¼ mile or fraction thereof for service beyond the local base rate area.

(a) Only to be retained until company is able to give one or four-party service.

Requests Approval of N. C. Common Stock Issue

Carolina Telephone & Telegraph Co., Tarboro, on Nov. 13 asked the North Carolina Utilities Commission for authority to sell 58,310 shares of $100 par value common stock at $100 a share to raise funds with which to reduce outstanding short-term bank loans, which now amount to 11.3 million dollars.

The short-term notes, it told the commission, are for money borrowed in the company's expansion program. The petitioner said it expects to spend for expansion some 4 million dollars during 1956 and some 12 million dollars next year, and that its program since the end of World War II has increased the number of telephones in its territory from 55,814 in 1946 to 140,223 in 1956.

The company said it wants to offer the stock to its shareholders at the rate of one new share for each four shares held.

The previous issue of Carolina Telephone stock was sold at $125 by commission order although the company wanted to sell it at par, $100, and appealed unsuccessfully from the order to the courts (TELEPHONY, Nov. 12, 1955, p. 36). In its application for the new stock issue it indicated that it hopes to persuade the commission to consider the change in the money market in fixing the price for the new issue.

"The market for equity securities has changed considerably since our last equity financing and the competition for the savings of the stockholders or prospective stockholders is considerably more active," Carolina T&T said. "Interest rates have risen appreciably, a fact which requires consideration in

maintaining a spread between debt securities and equity or risk securities, and the earnings per share on the outstanding common capital stock of the company are considerably less than at the time of our last equity financing."

Missouri Company Requests Financing, Purchase

The Urbana Telephone Co. on Nov. 9 applied to the Missouri Public Service Commission for authority to issue its additional 800 shares of cumulative preferred stock at $50 per share; also to issue notes to the REA for $593,000.

At the same time the company asked to purchase the Wheatland Telephone Co. from Mrs. Cecil Wolf.

Two Illinois Independents Ask Authority to Sell

Illinois Commerce Commission on Nov. 20 was to have heard the application of the Moweaqua Telephone Co. and the Kempton Telephone Co. for permission to sell their properties to the Inland Telephone Co., Champaign.

The Inland company also sought authority to borrow $687,000 from REA, issue $72,000 of its $100 par 5½ per cent preferred stock and $3,500 of its $1.00 par common stock.

N. C. Company Asks to Issue $750,000 Preferred

Central Telephone Co. asked the North Carolina Utilities Commission on Nov. 14 to approve its plans for issuing $750,000 worth of 20-year 4.5 per cent subordinate debentures in exchange for $750,000 worth of $2.50 cumulative preferred stock.

The stock is held by Northwestern Mutual Life Insurance Co. and Modern Woodmen of America. Northwestern will get $625,000 in debentures for 12,500 shares of the stock and Modern Woodmen $125,000 for 2,500 shares.

Central's North Carolina office is at Mount Airy.

General of Cal. Registers $10,000,000 Preferred

General Telephone Co. of California, Santa Monica, has put the 500,000 shares (10 million dollars) of 5% $20 par cumulative preferred stock it proposes to offer publicly, into registration with the Securities & Exchange Commission, it was reported on Nov. 15.

The stock will be marketed on a best efforts basis by an underwriting group to be named later, the company said. Part of the proceeds will be used for the repayment of short-term loans and expansion.

It's not surprising that in every field test the Chance 8-Way Expanding Anchor holds more than its rated load because its design just makes common sense. *Eight* blades expand to form a pyramid shaped square —there is no wasted space between blades. The load is distributed *evenly*—all around the hole. It just seems logical that it should hold more, and it does. That's why it's on so many company standards. Your Chance Anchor Distributor can supply you from stock. *Specify Chance for Service!*

"ANCHORING" is the most complete guide to anchoring and guying ever developed. Shows how to choose the right anchor for every job—and how to install it *right*.

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Slip in the drill point — and the famous "Yankee" chuck makes sure it stays! No slippage or pulling out of points when drill is in use.

Magazine handle holds eight drill points, 1/16" to 11/64". All exposed parts of Push Drill No. 41 are chrome plated.

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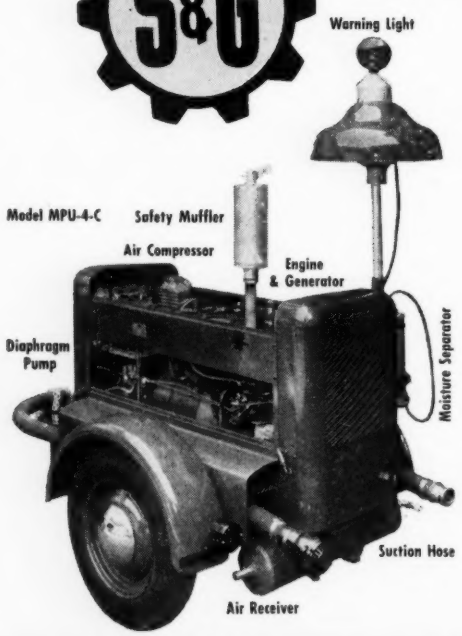

- **Generator (slow speed for quietness) 2500 Watt, 110-Volt DC**
- **Pump—2800 GPH Diaphragm to remove seepage and drain back**
- **Air Compressor—to put cables under pressure for cut-overs or repairs**
  Furnished with or without pump and compressor
- 300-Watt floodlight illuminates working area
- operates soldering pot and iron, electric and air tools
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- supplies dry air for cable cut-overs, flash testing, etc.
- diaphragm pump can be operated from manhole by push button control
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- light, easy to handle

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Okla. Company Requests New Schedule of Rates

The Grand Telephone Co., Jay, on Oct. 30 asked the Oklahoma Corporation Commission to approve rate increases for service in Jay and Disney.

The company said the Rural Electrification Administration has approved a loan of $170,000 to modernize the telephone facilities in the two towns if the new rates are approved.

Examples of the proposed new rates are:

	Old	*New*
One-party business	$5.00	$7.00
One-party residence	3.75	5.00
Two-party residence	3.25	4.25
Rural multi-party residence	3.00	4.00

Minnesota Commission Approves Four Sales

The following four sales were authorized on Nov. 12 by the Minnesota Railroad and Warehouse Commission:

Grand Valley Telephone Line and Kiester Valley Telephone Co., both of Bricelyn, sold to Bricelyn Mutual Telephone Co.

The Lindstrom exchange of Northwestern Bell Telephone Co. (serving 362 stations) sold to Chisago City Telephone Co.

The Waubun Telephone Exchange (serving 126 stations) sold to Twin Valley-Ulen Telephone Co.

N. C. Independent Asks Commission for Rate Raise

The Concord Telephone Co. asked the North Carolina Utilities Commission on Nov. 16 for permission to increase its rates enough to raise its gross annual income by $474,486.

The company stated the additional revenue would be used to finance a large expansion program to fulfill a steadily mounting and ever-increasing demand for telephone service.

Southeastern Asks Ga. OK On $750,000 Bond Issue

Southeastern Telephone Co., a subsidiary of Central Electric & Gas Co., Lincoln, Neb., asked the Georgia Public Service Commission for permission to issue $750,000 in bonds, it was reported on Nov. 13.

The company proposes to use the funds to convert its system in north Florida and south Georgia to automatic.

N. D. Company Incorporates

Lone Tree Telephone Co., Golva, N. D., has filed articles of incorporation with North Dakota Secretary of

XUM

State, it was reported on Nov. 2. Trustees include E. N. and C. S. Schmitz, Gerhardt Fischer and Frank J. Kreitinger, all of Golva.

California Commission OKs Sale of Independent

Sale of the Shasta Telephone Co., Millville, Cal., to Citizens Utilities Co. of California, Redding, has been authorized by the California Public Utilities Commission, it was reported recently.

Mr. and Mrs. Raymond W. Coffelt have been owners of the exchange since 1947. In their application for approval of the sale, they indicated revenues from the business are not sufficient to permit them to employ additional personnel to manage the system.

Sale of Central Properties In North Dakota OKd

The Iowa-Illinois Telephone Co., New London, Ia., has been issued a certificate of public convenience and necessity by the North Dakota Public Service Commission to operate facilities of the Central Telephone Co., La Crosse, Wis., in the lake region of North Dakota, it was reported on Oct. 25.

An order by the commission also authorized the Iowa company to buy Central Telephone properties at Devils Lake, New Rockford, Cando and Webster.

Microwave Keeps Fla. Town In Touch During Flood

Microwave radio played a prominent part in maintaining communication for one town hit by the recent torrential rain and subsequent flood in Florida.

It was reported that the only communication into and from Kissimmee (one of several towns hit by the flood) was through the microwave radio circuit of the Florida Telephone Corp.

In Kissimmee, residents were using boats on the main street, and telephone lines were down.

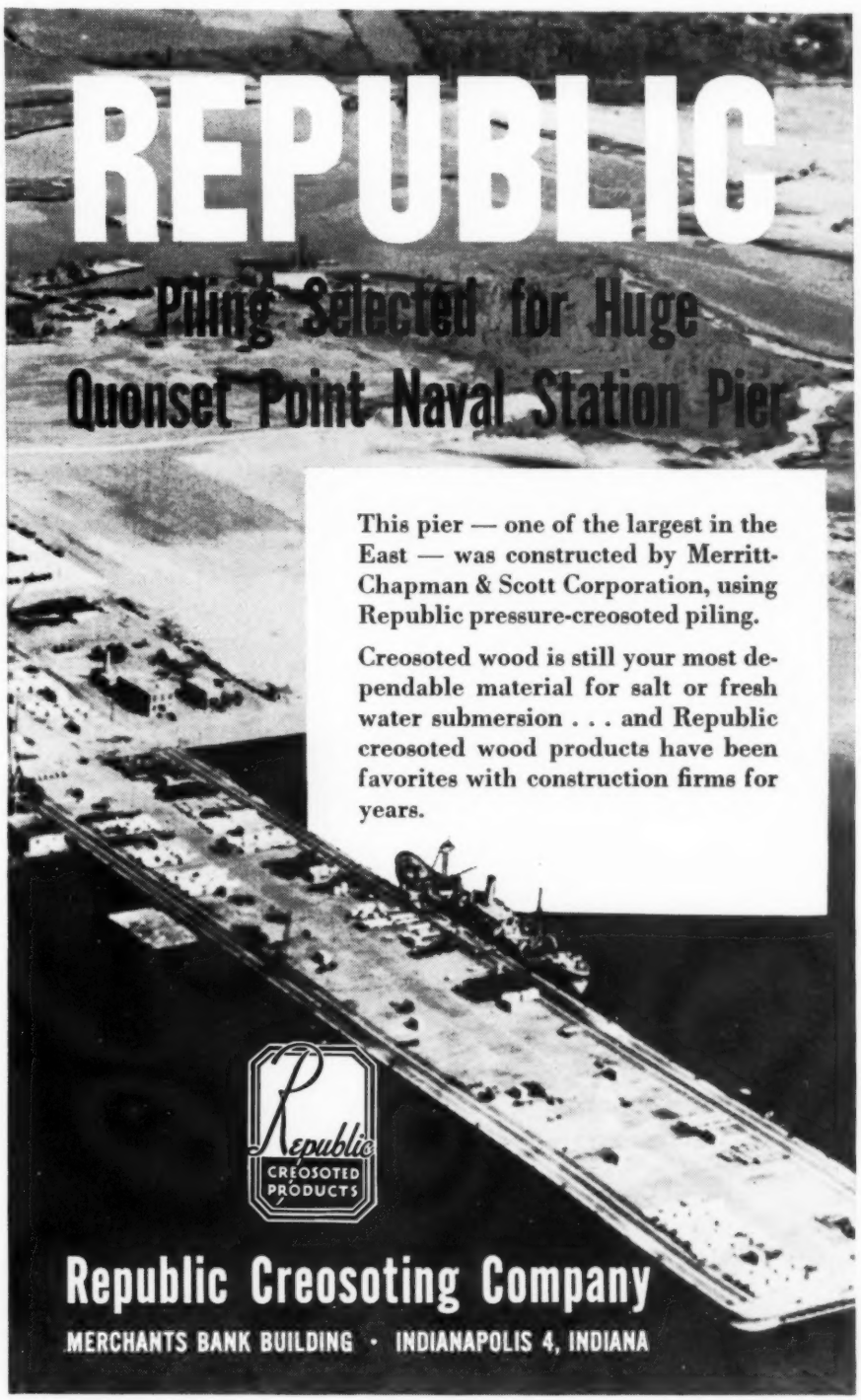
Kissimmee microwave radio tower of Florida Telephone Corp.

Testimonial Dinner Honors Col. Gustav Hirsch

A testimonial dinner honoring the 80th birthday of Col. Gustav Hirsch, prominent telephone engineer, was held in Columbus, O., on Nov. 2. A large group of telephone industry leaders, public officials and others gathered at the Sciota Country Club for the celebration.

Among those present were USITA President Donald C. Power, L. M. Berry, of the L. M. Berry Co., Dayton, Chairman George C. McConnaughey of the FCC, and the mayor of Columbus. Hollywood's George Jessel was master of ceremonies. As part of the ceremonies, Colonel Hirsch was presented with a large framed tribute on parchment.

Mr. Hirsch is founder of the Gustav Hirsch Organization Inc., and a past president of the Ohio Independent Telephone Association.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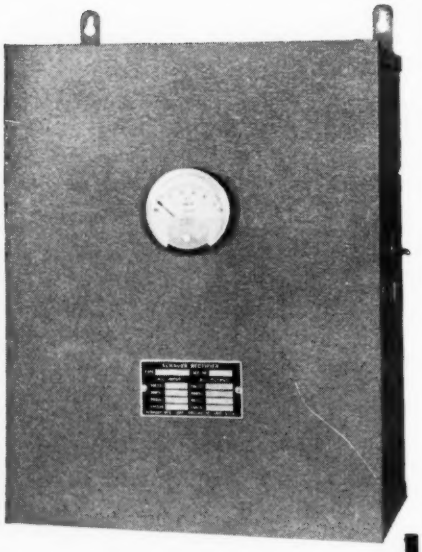

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General of Michigan Names Six Division Managers

T. A. Saunders, president of General Telephone Co. of Michigan and Union Telephone Co., recently made known major organizational and personnel changes within the two companies.

As part of the consolidation of operational activity leading to eventual merger of the two organizations, district reassignment and the formation of three new divisions has been accomplished. Mr. Saunders stated that the reorganization was effective Nov. 1, although personnel shifts will take some time to finalize.

The two telephone companies, part of the General Telephone System, will now operate through six divisions with managers and headquarters as follows:

Western, F. Hilgeman, at Muskegon; northern, W. J. Imeson, at Alpena; eastern, J. M. Stimson, at Imlay City; central, Robert Trezise, at Owosso; southeastern, I. L. Foy, at Adrian, and southwestern, M. J. Hoeksema, at Coldwater. General offices are located in Muskegon.

Southwestern Bell Elects Two New Vice Presidents

The board of Southwestern Bell Telephone Co. on Nov. 16 elected two new vice presidents.

F. Mark Garlinghouse, general counsel since 1953, was named vice president and general counsel, and James A. McCollum, comptroller since this March, was elected vice president and comptroller.

To Manage S. C. Company

W. Vance Doby, for the past several years commercial supervisor of the Durham (N. C.) Telephone Co., has been named manager of the Seacoast Telephone Co., Myrtle Beach, S. C. Both companies are members of General Telephone Co. of the Southeast, Durham.

Inflation Hitting Us, Too

Inflation is "taking its toll" in the magazine publishing field, as it is in all businesses today. Publishers are finding it necessary to increase the prices of their products to cover increased costs of raw materials, supplies and labor. It is imperative that we make a slight raise in our subscription rates. The last increase in these rates was made in July, 1951.

Therefore, effective Jan. 1, 1957, a small increase will be made in our subscription rates, which will apply to all subscriptions expiring after December 31, 1956. (EDITOR'S NOTE: When this information appeared in TELEPHONY, Nov. 10, 1956, page 34, certain mistakes were made in the rates for Canada and Pan American countries. Below are the correct rates.) The new rates, and a comparison with present rates, are as follows:

U. S. and Countries in U. S. Postal Zone

	New Rate		Old Rate
1-year subscription	$4.00	(7.7¢ per week)	$3.50
2-year subscription	6.50	(6.3¢ per week)	5.50
3-year subscription	8.50	(5.5¢ per week)	8.00
Single copy	.25		.20
Special issues	.40		.35

Canada & Pan American Countries

1-year subscription	$ 5.00	(9.6¢ per week)	4.50
2-year subscription	8.50	(8.2¢ per week)	7.50
3-year subscription	11.50	(7.4¢ per week)	11.00
Single copy	.25		.20
Special issues	.40		.35

All other Countries

1-year subscription	$ 6.00	(11.5¢ per week)	5.50
2-year subscription	10.50	(10.1¢ per week)	9.50
3-year subscription	14.50	(9.4¢ per week)	14.00
Single copy	.25		.20
Special issues	.40		.35

Group Rates

All special group subscription rates will be increased by 50¢ per subscription.

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is the
Modern Way
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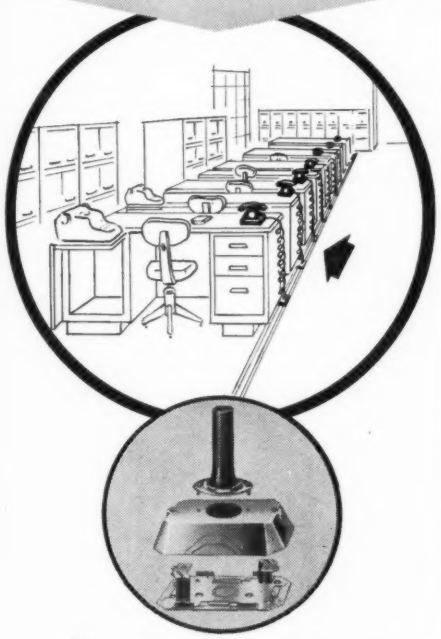
communications
wiring to the
point of use!



Pancake is the streamlined, modern method of making individual telephone connections to office desks or communication points in factories. The galvanized steel, *trip-proof* surface raceway can be quickly and economically installed with a *minimum* of interruption to office or factory routines.

Features added to the newly developed 1546T Telephone Outlet Box, *illustrated above*, provide (1) an ingress for 2600 Pancake, and (2) the "split bridge", which extends the versatility of this fitting, provides a more simple means for the installation of the 47B terminal block, and facilitates the use of the fitting for through wiring.

Specify 1500 Pancake for JKT Conductors; 2600 for telephone cable.

For further information write Dept. T-4

THE WIREMOLD COMPANY
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Woman Named President of Pennsylvania Independent

Mrs. Bertha B. Eaby has been elected president of the Denver & Ephrata Telephone & Telegraph Co., Ephrata, Pa., it was reported on Nov. 1.

She succeeds her late husband, C. E. Eaby, who died on Aug. 12 of this year. She is the third president of the company.

Mrs. Eaby became affiliated with the company in 1912 when she accepted a position as bookkeeper. In 1916, she became office manager and assistant secretary and treasurer. She was elected a director of the company in 1927, and became vice president in 1944.

Mrs. Kenneth Bitzer, Ephrata, was appointed to fill Mr. Eaby's unexpired term on the board of directors. William Brossman was elected vice president and secretary; and David R. Eaby, vice president and solicitor.

Home T&T and Citizens to Merge with General of Ind.

The boards of directors of The Home Telephone & Telegraph Co., Citizens Independent Telephone Co. and General Telephone Co. of Indiana, Inc. on Nov. 16, all gave their final approval to a plan of merger whereby the Home company and Citizens company would be merged into General Telephone Co. of Indiana, Inc., according to L. H. Meyer, president of all three telephone companies.

The shareowners of the respective companies approved the merger on Oct. 17. Mr. Meyer said that the merger is expected to become effective early in December when final authority is expected to be granted by certain regulatory authorities.

The integrated companies will serve more than 281,000 telephones in 89 exchanges including such areas as Fort Wayne, Terre Haute, Lafayette, Elkhart, LaPorte, Valparaiso and Logansport.

Comments on Nationalization

"Nationalization, a form of socialism under which the government controls basic resources and industries, is a two-way street. . . . The return of a nationalized function to private operation is both possible and feasible. . . . However, it is much easier to scramble than to unscramble. . . . England's conservative government has been finding this out. . . . Since coming into power in 1951, the conservatives have tried to denationalize only two, the trucking and steel industries. Neither effort has been entirely successful."—International Falls (Minn.) *Daily Journal.*

Superior's
"Super-Splice"®
is
safe
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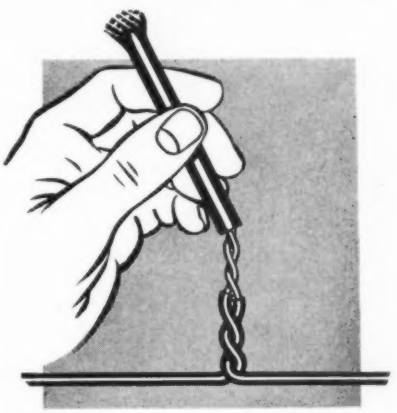
sure!



"Super-Splice" makes splices waterproof . . . from inside out!

Sealed at one end, this plastic splice sleeve is filled with an insulating and waterproofing compound.*

Economical "Super-Splice," a Superior exclusive, makes the splice permanently as good as the cable . . . yet it can be re-entered easily. The compound never hardens or oozes out no matter what the temperature.

Prevent leakage currents and breakdowns in the presence of moisture...good for 25,000 v.d.c. Order "Super-Splice" NOW!

*A Dow-Corning silicone compound.

An REA Standard.

"Super-Splice" is available for use with straight, butt or bridge splices.

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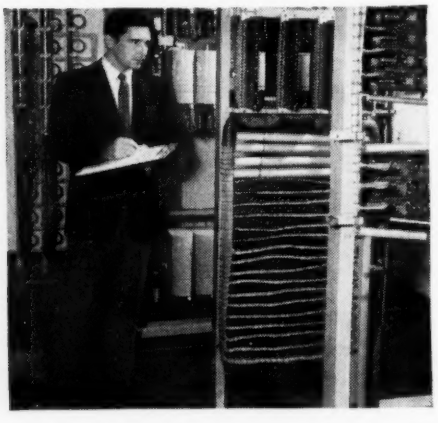

American Appraisals of reproduction cost may affect rates

An American Appraisal report of the cost of reproduction provides convincing evidence in the preparation of an appeal for adjusting rates to provide a more equitable return.

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leader in property valuation
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Holan Corp. Appoints Frank Assistant Sales Manager

Arthur C. Frank has been appointed assistant sales manager at the main plant of J. H. Holan Corp., Cleveland 11, O.

A. C. FRANK

Before returning to Cleveland, Mr. Frank was sales manager for Holan Corp. of Georgia, Griffin, Ga. He joined Holan in 1953 after three years as sales manager for Transport Products Co., Cleveland, and 10 years with American Coach & Body Co.

The new assistant sales manager attended Bradley Tech.

Philco Corp. Acquires Sierra Electronic

Philco Corp. has purchased the Sierra Electronic Corp. of San Carlos, Cal., in a major move to expand its research, engineering and development facilities, it was announced on Nov. 8 by James M. Skinner Jr., Philco president.

The Sierra Electronic Corp., a research and instrument manufacturing concern, will be operated as a wholly-owned Philco Corp. subsidiary under its current president, Willard Feldscher, as vice president and general manager, according to Mr. Skinner.

Acquisition of the Sierra Electronic Corp. will augument the electronic research and engineering laboratories and manufacturing plants of Philco's government and industrial division currently located in Philadelphia and vicinity, Mr. Skinner said. Sierra will move from San Carlos about Feb. 1 into a new plant now under construction in Menlo Park, Cal. Philco plans to increase the number of engineers and technicians presently employed by Sierra.

Philco's government and industrial division is a major supplier of complex electronic equipment for all branches of the Department of Defense as well as industry. The current engineering and instrument manufacturing activities of Sierra will be expanded, the company stated. In addition to classified electronic equipment for the military, Sierra manufactures specialized electronic test equipment, UHF transmitters, television studio equipment, radio navigation equipment and microwave relay links.

The Taxpayers' Money

". . . we would find it even more novel if the political leaders, economic advisers, and administrative experts would—just once—debate this budget surplus not as a problem for bureaucratic manipulation but as a problem of what is fair and just for your government to do with your money."—EDITORIAL STATEMENT, *The Wall Street Journal.*

Will O' the Wisp

"Fortunes made in no time are like shirts made in no time. It's ten to one if they hang long together."—DOUGLAS JERROLD.

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Light in weight and clean. PENTAchlorophenol treated in our modern plant for protection against decay, moisture and insect damage.

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AE Announces New Line-Up In Carrier and Radio

Jack B. Arnold has been appointed manager of the carrier and radio division of Automatic Electric Sales Corp., succeeding Joseph N. Petrie who has become chief transmission engineer of Automatic Electric Laboratories.

J. B. ARNOLD

Tate B. Collins Jr. has been appointed assistant manager of the carrier and radio division, in addition to his present duties as eastern district manager.

B. K. McCANN

Bliss K. McCann has been appointed western district manager of the division.

Mr. Arnold, who joined Automatic Electric in 1948, served as assistant to the president of the sales corporation from 1948 to March 1949; as staff engineer in the Rome, Italy office of International Automatic, from March 1949 to June 1952; returned to Chicago in June of 1952 on a special assignment for International and the following year, 1953, returned to Rome again. In 1955 he was appointed manager of the western district for the carrier and radio division in Chicago, a position he has held to the present time.

T. B. COLLINS JR.

Mr. Collins joined Automatic Electric in 1952 after 13 years of service with the transmission engineering group of Southern Bell Telephone & Telegraph Co. at Louisville, Ky.

Mr. McCann, a native of Kansas City, Mo., received his engineering education at the Illinois Institute of Technology. He worked in the installation department of Western Electric from 1945 until 1952, when he joined Automatic Electric as a staff engineer.

Automatic Tells Stock Plan For Colored Telephones

To help operating telephone companies with inventory problems, and at the same time further speed up deliveries, Automatic Electric Co. has announced a plan of maintaining colored telephones in warehouse stock, less ringers.

When orders are received, the telephones will be shipped, together with separately packaged ringers of the types specified. By this arrangement telephone companies will not have to keep so many different kinds of colored telephones in stock, the company says.

Automatic will continue to furnish telephones equipped with ringers when orders so state.

Partisan Zeal

"After listening to speakers of both parties belabor one another you wonder whether they're describing rival candidates for office or men wanted by the police." — *Abilene (Kan.) Daily Reflector-Chronicle.*

high-quality, long-lived

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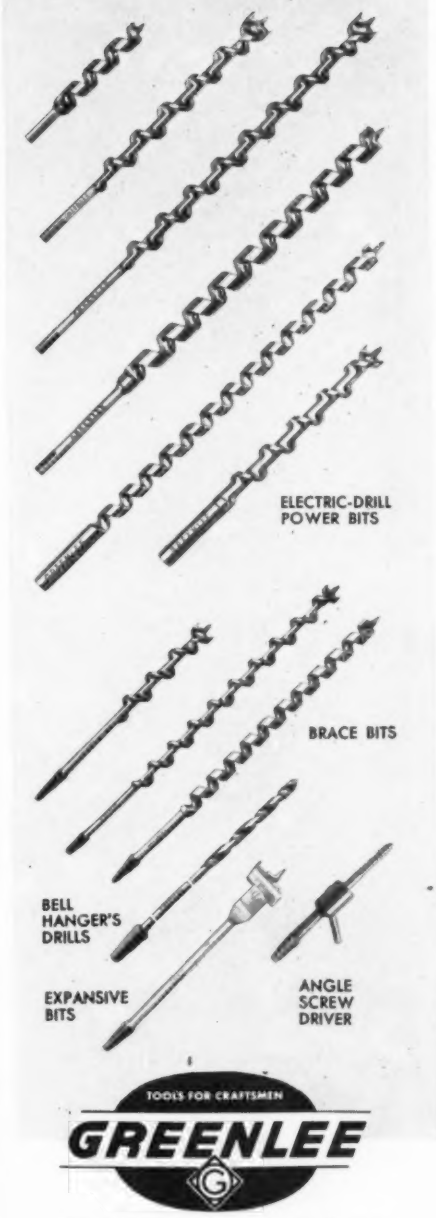
for pole, crossarm, and timber work . . .



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Smooth texture, easy to handle. Preferred for switchboard use.

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B. J. Carney & Co., 100 N. 7th St., Minneapolis, Minn.—Western red cedar poles. Pentrex Butt Treated or Plain.

Cascade Pole Co., P.O. Box 743, Tacoma, Wash. — Creosoted Douglas Fir and Cedar Poles.

C. M. Christiansen Co.—Northern White Cedar Poles, Pentachlorophenol treated. Plant and Yards, Phelps, Wis.

Dierks Forests, Inc. (formerly Dierks Lumber & Coal Co.) Wood Preserving Division, 810 Whittington Ave., Hot Springs, Arkansas. Southern Pine select poles, all sizes and lengths, creosote and penta-pressure treated. Prompt shipment.

Eppinger & Russell Co., 80—8th Avenue, New York 11, N. Y.—Creosoted Poles and Cross Arms. Plants: Jacksonville, Fla., Norfolk, Va., Eddington, Pa.

International Creosoting and Construction Co., Galveston, Texas.—Creosoted Southern Yellow Pine Poles. Plants Beaumont and Texarkana, Texas.

Lone Star Creosoting Company, Inc., P.O. Box 9, Longview, Texas. "Texas Best" Pressure creosoted Southern Yellow Pine Poles. Inquiry invited.

The Long-Bell Lumber Co., 926 Grand Ave., Kansas City, Mo.—Pressure-treated Southern Pine and Douglas Fir Poles. Creosote and Penta preservatives.

Texas Creosoting Company—512 Main Street, Orange, Texas—Creosoted Southern Yellow Pine and Douglas Fir Poles. Can also treat with "Penta."

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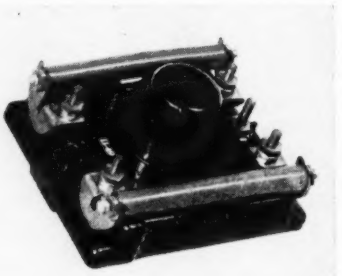

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WESTERN ELECTRIC #98A
Station protectors, complete with two No. 11C fuses, Two No. 2G and Two No. 27 protector blocks
Price.....$ .75 each
Lots of 100.....$ .70 each
Lots of 500.....$ .65 each

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Magneto Compact set convertible to desk or wall. Equipped with capsule type transmitter and receiver. Can be used on long rural lines.
Shipped complete with terminal block and refinished battery box.
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12 or more—$18.00
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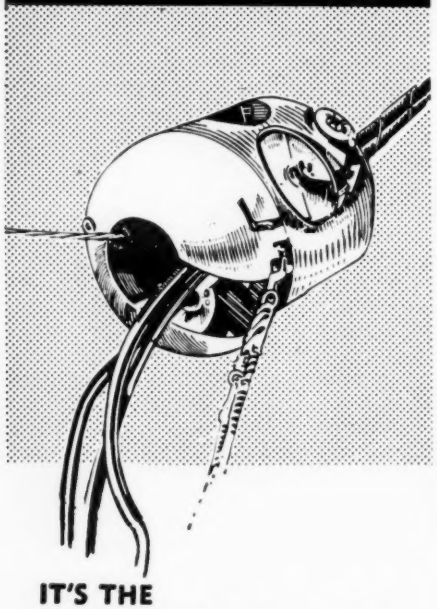

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